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Compaq's SLT/286 Portable — Does Great Technology Make It the Laptop Leader?

Personal Information Managers

Cut the Clutter!



25 Information Organizers That Work the Way You Do

Finally!

Professional-looking Envelopes from Your LaserJet

- 6 Utilities
- 6 Word Processing Macros
- 2 Keyboard Macros
- 1 DOS Batch File

LAN Reality Check: John C. Dvorak and Jim Seymour Sound Off





This is for ev too busy to get

If you're the type of person who's too busy to read an ad, read this ad.

Because you'll learn about a new tool that will help you manage people, ideas,

You can record the thousands of tasks vou need

to address to put together a

new product line. Or the thousands of factors you need to put together a new bottom line. Agenda will not only file these random

items of information for you, it'll help you arrange them any way you want. So you can understand them better. formulate new ideas better and extract all

the answers you need better.

Which means, now you can concentrate





projects, and information with incredible efficiency. A tool that will help you avoid slumping into your chair, shaking your head, and asking, "How on earth will I ever get this done?" We call it Lotus' Agenda, the personal information

dump random facts, thoughts, and ideas into your PC without having to structure the information in advance. Agenda's filing system is a more suphisticated version of this filing system. Was can put thems anywhere you want. View them any way you want. And have access to

Agenda allows you to

manager.

yone who's ry work done.





more on using and acting on your infor-

mation. And less on processing it. How does Agenda work?

First, enter your items of information



into your PC and assign them to catego-

ries that you create.

Then Agenda will do all of your filing automatically. And thanks to Agenda's multiple filing capabilities, if the information is relevant in more than one place. Agenda will take it and put it in several categories at once.

This makes it easy to view your data in

can pinpoint information that's important to you. Or discover new relationships you hadn't considered before. And anytime vou change an item in a view. Agenda will

different ways so you

automatically update all other categories where the item has been assigned.

In fact, you could say that Agenda recalculates your text the way a spreadsheet

program recalculates numbers. All of which means, from now on you'll be able to come in every morning, check your Agenda, and get right to work.

Because you'll immediately know what work needs getting to.

For \$15, we'll send you an Agenda demo kit or videotape. Call 1-800-345-1043 and ask for demo kit.

AGK-3058 for the 3.5" version or AGK-3053 for the 5.25" version. Or ask for videotape AGK-3063



Introducing Lotus Agenda

What you've been doing.



On your 286, you've been making any task look complicated.



On your 386, it hasn't been incredibly exciting having all that tower.

If the screens on the right look more intriguing to you than those on the left, woulte ready for Microsoft" Windows.

Windows opens up the world of visual thinking to all 286 and 386 owners by offering the power of graphics.

Everything you can do on your PC, you can now do better, faster and with greater imagination. Whether you're creating documents or trying to get a clearer picture of your work.

What used to take complicated legstrokes can now be accomplished with the simple click of a mouse. With Microsoft Windows, you access pulldown menus. Simultaneously work with different programs as well as out and paste between them to create graphic examples within different bodies of text. And what you see on the screen will appear on your printed page.

And once you've learned Microsoft Windows, you'll have the basis for sores of other programs because all the countless new Windows applications are based on the same easy, locical format.

Since Microsoft Windows virnully looks and works like MSY GS/2 Presentation Menager, you won't have to worry about it becoming obsolete in a couple years. We made both systems computible. So, in the future, you'll have been been a few of the original of the country of the country of the analysis of the country of the country of the data between them. And your knowledge of Windows will give you a jump on kam-

ing MS OS/2 Presentation Manager.
You'd expect a program this powerful
to require a more powerful machine. But
we consistently create software that makes

What you could have been doing.



With Windows/286, you could have been seeing things much more clearly.



With Windows/386, you could have been seeing a lot more things much more clearly.

the best use of your present hardware. For example, Microsoft Windows/ 286 will work with as little as 640K and

instantly make your machine more sensitive, intuitive and highly visual. It gives you the ability to nun every Windows application available. And with access to all those bowerful proporaries, world.

be able to extend the life and usefulness of your 286 well beyond the introduction of MS OS/2 Presentation Manager. With version 2.1 you also get the benefit of increased speed. So you'll blaze through Windows applications up to 87% faster.

Microsoft Windows/386 will give you everything that Windows/286 gives you. Plus multitasking with most DOS applications. Now you can finally utilize the speed and power of any 386 machine.

Imagine creating a complicated spreadsheet. Then while a macro is being run, open up a word processor. Type a document, open and work with a

graphics program. Cut and paste between programs and even call up electronic mail. And still be able to check on the status of your spreadsheet at any time.

Considering all you can do with Microsoft Windows, you have only one question to ask yourself.

What have you been doing without it?

Microsoft*

Quick Access. Easy Edit.



Fast free-form retrieval with integral multi-window editing

for the files and programs you're using *now* —

for DOS and OS/2

See Golden Bow Systems' ad on page 103.



GOLDEN BOW SYSTEM

619/298-9349

WHAT'S INSIDE

For most of his professional life, contributing editor Edward Mendelson has taught English literature at Columbia University, adding inexhaustibly to the body of critical literature that exists on the work of the poet W. H. Auden. These days, most of Mendelson's research time has been spent not in the Morningside Heights campus's Butler Library studying poetry, but in One Park Avenue's PC Labs writing macros that make the job of addressing and printing envelopes on the Hewlett-Packard LaserJet family of printers as effortless as possible. The result of his extracurricular labors is our feature story "Printing the Perfect Envelope."

If you've never tried to coax, bribe, or threaten your Laserful into printing an envelope, you might be under the false impression that commanding it to do so is a trivial matter. In fact, like Mendelson, the majority of

PC users have learned the hard way that just the opposite is true, sometimes going through a hundred or more envelopes before stumbling on the right combination of keystrokes and commands. "Almost severy other day, someone on Computer asks for a macro to help with envelope addressing," says Mendelson. "Some WordPefert macros do exist on Computer Severy, but it second like it was time that Severy, the severy of the computer of

Mendelson went even further than that: he wrote macros for two keyboard macro programs as well as a handy DOS batch file that allows you to print an envelope think so.



Edward the Great during the reign of envelopes

when you aren't using any application program at all, and—mirabile dictu—he als reviewed six low-cost dedicated envelope addressing programs.

About users' inferent in envelope-active dissign marros. Mendelon in it 'umo dessign marros. Mendelon in it' umo dessign marros. Mendelon in it' umo we ve received countless letters from react encreasting that we publish such as 1900 Yet, one piece of evidence makes us wor der wherber a more subtle and poetic inflie ence wasn't also at work, impring Mendelon to compose the furution-bet to furtie the sequence in the before to the promotion of the properties o

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he new BigBin holds five times more, so you feed it five times less.



1000-sheet capacity for Canon SX. Ricoh 4150 & 4080/4081 engine llaser printers.

BigBin.

The BigBin™ sheet feeder replaces your laser printer's old 200-sheet paper tray to give you 1,000 sheets of paper. That means you spend more time working on printing jobs, and less time refilling paper.

Impressive numbers Think of BigBin as a motorized paper tray that lets you load 1,000 sheets of letter-size paper. All at once. You can even add a kit that handles legal-size."

Even high-volume and multiuser environments get up to two hours of continuous printing. Without the interruption of another empty paper trav.

Simple addition All it takes to multiply your paper-handling capacity is a little addition. Just replace your printer's paper tray with the 1,000-sheet BigBin and plug it into the wall.

Despite the big name, BigBin needs only about a foot of space in front of your printer, and it weighs in at only 14 pounds.

A multiple of three BigBin is available in three models that connect to laser printers

with Canon SX°. Ricoh° 4150 and Ricoh 4080/ 4081 engines.

The Canon SX works in the OMS-PS* 810. KISS"plus and HP' LaserJet Series II'. The Ricoh 4150 supports the QMS Lasergrafix* 1510. QMS SmartWriter 150 and Texas Instruments Omnilaser", models 2015 and 2115. The Ricoh 4080/4081 series includes the AST TurboLaser", the DEC LN 03', and Texas Instruments Omnilaser 2108.

All three BigBin models are available exclusively through Laser Connection" dealers. For more information on how BigBin can maximize your paperhandling, call Laser Connection at 1-800-523-2696 for the dealer nearest you.

And be sure to ask for The Sourcebook"our exclusive catalog filled with the latest laser printer products and enhancements.







COVER STORY

Classified Intelligence: Managing Personal Information Bill Howard/ Desktop

disarray, schedule conflicts, priority confusion-the demons of disorganization are banished when one of these 25 personal information managers steps into your office to help you work more efficiently. Our reviewers look at the wide range of programs that make up this still-evolving genre of

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PRODUCTIVITY Printing the Perfect Envelope Edward Mendelson/ Until now. the process of addressing and printing envelopes on an HP LaserJet printer was a tedious, error-prone endeavor. PC Magazine thoroughly addresses the problem, with our own macros and a look at six envelope-addressing

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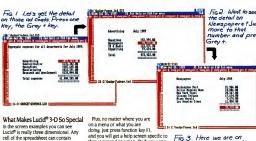
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COMDEN/Full '88

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cell of the spreadsheet can contain a complete other spreadsheet that you can access with a single keystroke. It is as simple as the pictures show. And you don't have to write formulas to do that.

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level 3. There's no limit to the levels you can move down!

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Jim Seymour, Columnist, PC Magazine, PC Week

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ook! Luerd does muttiple windows. Natice: different drives directories, own many 3-D levels. All at the some time!

Now his shared being supported by the part of the part

Here, we popped Lucid up over Word
Perfect. Then we pumped those figures
into a letter on-the-fly with the Clipboard
Click, click — that quick!

nere one choice can take you down a vel to a whole new set of choices. hat's nice is that they will work from he spreadsheet to another.

ouseability

ucid[®] 3.0[°] was designed for both leyander enthussars and mouse lovers file. You can take your pick. Designed by the mouse from the ground to the interface is smooth and natural. vs select files to load from directory as Everything is point and click. What's one any Lucid[®] 3-10[°] menu selection in be "moused" and the

sponse time is "right now" Instead of a sluggish "a little bit behind you" feel add-on mouse menu systems like cose you've seen with 1-2-3. A window pops up with a library of motion names you can page through th the mouse. Select, click and it's

It the formula with no typing required. we even have a label window that you in fill (from the keyboard) with favorite cels and names so that you can insert eme later with the mouse. There's even cop-up calculator to insert numbers so ki don't have to go to the keyboard my often.

It really permits that feeling of scoming one with your work. Lucid D^M has windows of user defined range imes as well as the macros named by suser that can be selected just by pointing and clicking I cons that are easy to grab with the mouse let you resize and move the spreadsheet window with the ease you would expect. Plus you can go anywhere on the sheet by moving the mouse and clicking on the spreadsheet borders. And remember, Lucid's led signed so that any of those features are done with or whout the mouse easily and quickly.

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LETTERS TO PC MAGAZINE



SUPPORTING TOSHIRA The review of the Toshiba T5100 did not

mention the availability of 2 extra megabytes of 32-bit memory and Toshiba's superb user support ("Take It



or Leave It: Portables with Desktop Power." PC Masazine, October 11, 1988), Instead, the review consisted of an endless and hard-to-follow diatribe against the T5100's screen, which I find to be much more readable than an LCD screen.

The reader is also left with the impression that the T5100 does not take a coprocessor, nor does it have expanded or extended memory. This is plainly inaccurate. The T5100 on which I typed this letter has 2MB of expanded memory, 384K of extended memory, and an 80387 coprocessor in it!

Larry Greenhill Hammond, Indiana

IBM WISH LIST

I don't understand IBM. When the first PC came out, I was excited-wow, expansion slots! But now, years later, nothing really exciting besides speed has been added.

The new Tandy 1000 SL and TL computers have sound capabilities built into them: IBM's idea of enhancement is a zero-wait-state on an 80286-based system. IBM needs to bring out a computer that is useful for business and home users and

doesn't require an upgrade every year. The dream computer should have a 25-MHz zero-wait-state 80386, with a Microsoft Windows-type operating system.

All I want is a useful, standardized computer that will last about as long as my car. since they are almost as expensive now!

Frank Loeffler Berkeley, California

COBOL: AFTER ALL THESE YEARS

In the view of many naive programmers and columnists, COBOL may seem an anachronism (Inside Track, PC Magazine, September 27, 1988), but it offers certain features that have yet to be replicated in

any other language or system. COBOL applications are inherently self-documenting and include useful logical and data structures. I have also found that maintaining a business application in COBOL is far easier than one written in BASIC, C, or even using a 4GL.

Mark S. Crego Burke, Virginia

After 20 years of using COBOL, I find Mr. Dvorak's glib dismissal of it to be a slap in the face to me and the thousands of installations that continue to successfully use

COBOL (Inside Track). No computer language can legitimately claim to be a panacea, but COBOL continues to be an efficient tool in meeting the

dynamic changing needs of business. John H. Fawcett

Salt Lake City, Utah

COBOL may be short on glamour, but glamour is not something working programmers need (Inside Track).

COBOL may oblige you to say ADD when you add something or MOVE when

you want to move something. < Shakespeare's English.

COBOL may have a blue-cbut for consultant's fees of \$60 up. I'll wear a blue collar. C: not be sexy, but neither was my

Nova, and it was the best car I' John Derb New York

COBOL is, indeed, a russed Nova kind of programming last snide comment was uncalled for up for it. I will make the popul. COBOL on microcomputer work. After that is accomplished to popularize RPG II on a mis ready working on a spreadshe

written entirely in COBOL. -John C. Dvorak ANTHOUE COMPUTING

My Ph.D. brother-in-law a grammer son both sneer at my with two 514-inch floppy ("Feelings of Inadequacy. Tool." PC Magazine, Sep-

1988). I own an antiques shop, and tant tools are my 11/2-ton van 3 puter, which has become ebookkeeping, Slow? Sure, it 1. 1 onds to recalculate my profit month. But it takes longer the

my van out of the driveway and I do that several times a da John 1

Stanto

RESPECT FOR THE FLDE! PC Magazine has become far with the "latest and greatest" ly ignoring those who must co

PC MAGAZINE . DECEMBER 13, 1988

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OUTSTANDING

53 - Create, Ill in & print yr business forms wEZF-orms, 512K.

79 - Generate statements, case record leaping withe invoices 1 117 - Handle your personalitiz maney picture will reance May 8 1 12 135 - (2 diste) Track inventory, sales, wPC-Acut booking mgr. (|2| 150 - (2 dids) Mass Appeal mail mgr for envelopes, labels, etc.|
|2| 190 - Male accurate jub, cost estimates wFDS*Quale. 540K. | 201 - Log bank transactions, produce financ'i reports wChecks. 2 226 - (2 dicks) File Express menu driven all purp distalaces mgs 2 232 - 12 delta) Friendly Dr. Data mail may is easy-to-use. 640K. 294 - Control & update inventory w/T Master, know daily level 257 - Add special chars, line graphics to yr word process w/Q.
316 - Manage clients, sales prospects w/Toucief 512K, het disk.

[3] 319 - (2 debs) Keep appointmets, update agendas wiExDesk 337 - Analyze your credit charges, paymets, interest wiCharg 383 - Track yr porticlio, get weekly reports wild **EDUCATION**

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| 3 - Pay Backgammon, or Wordplay (Ne wheel of brissnif) |
| 84 - Three solitaire card games, Spicke (Kordline, Carriedt in) |
| 101 - Outhert, Pango, Confends, Hopper (& Froggar), mont in)
| 101 - Hack pute you & brudy day in a weld advention (& Roguel), | 176 - Destroy enemies wSefer, compare the world in Risk. ±
| 215 - Solve, create own word puzzles with Phrase Casse!
| 289 - 3-0 Pacmen, Kong, Spacewar, ASM (messle and), ± 309 - Blackjack (you set rutes), ArmchairCB, imperial worf 321 - Stor Tink, the origin1 Colossal Caves Adventure, more.

[1] 365 - 5 dialo] Create your own get adventure games, 384K. UTILITIES 136 - Packed sepret uils for print specifing, banners, forts, etc. I 141 - Pirt wide doorer Meets siteways wOn-Side! | sons wZo-Phone cross et. | I 141 - Print wide documents/preachiteens sideways w/On-Sidel I
III 214 - (2 disks) Search for addresses w/Zp-Phone cross ref. I
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■ LETTERS

by with older, but still perfectly functional, technology. Bill Howard's response to Pat Nims (Letters, PC Magazine, September 27, 1988), who felt that you are placing too much emphasis on state-of-the-art equipment, was out of touch with reality. Could this be an indication that PC Magazine is losing touch with reality?

Joel Klutch Castro Valley, California

Using a computer is akin to using drugs: the more power and speed you have, the more you want. Many of us, however, cannot afford nor do we need the latest 25-

MHz 386 machines. While the 286 machines are becoming fairly common, there is a very large installed base of the 8088 machines. This market is one from which you are drifting away. Don't retreat from the "new" stuff, but please don't forget us "on-the-cheap"

> Leland W. Olmsted Olathe, Kansas

SCIENTISTS NEED GRAPHS, TOO More attention needs to be paid to the scientific community. None of your discussion or tables on graphics programs

("More than Meets the Eye: Designing Great Graphics," PC Magazine, September 27, 1988) mentioned logarithmic scaling capabilities or compatibility with sci-

entific format numbers Remember, PC Magazine is valuable to others beyond the business community. Les Slaback

Gaithersburg, Maryland

APPROPRIATE INTERRUPTION

The Bernoulli Box II review ("Removable Mass Storage: You Can Take It with You," PC Magazine, September 13, 1988) states that "the box does not respond to interrupt 25h calls" and "since the BIOS Disk Seek test relies on the interrupt 25h call, we were unable to obtain re-

sults for the Bernoulli." Interrupt 25h is a DOS interrupt and the BIOS disk inter-With You rupt is 13h. My Bernoulli Box 10+10

DOS interrupt 25h but can cause problems if accessed by BIOS interrupt 13h. Your description is the graph and tables in the article appear to give the correct description

has no difficulty being accessed by

> N. Gray Edmonton, Alberta Canada

 The face of consumer products has changed since Henry Ford said

"You can have a Model T in any color, as long as it's black."

SELLING BY NUMBERS

John C. Dvorak attributes the use of num bers and letters to name foreign cars to some "nonexistent-merchandising the ory" ("Selling Sizzle with the Steak," Po Magazine, September 13, 1988). It's no as simple as that. There are some name that work internationally (for example Rambo, McDonald's), but numbers are al together safer and simpler to use acros cultural barriers. Translations into certain languages can change the entire meaning of the original name.

I do, however, agree with him about color!

Nick Miller London, England

The face of most consumer products ha changed since Henry Ford said, "You can have a Model T in any color, as long as it'



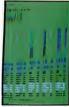
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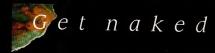
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LETTERS

black" ("Selling Sizzle with the Steak"). If it were up to the PC clone makers, however, we'd all be driving around in beige Chevys.

Jonathan Angel Palo Alto, California

 The computer will never replace a good executive secretary for keeping information organized.

CONNECTING OVER THE PHONE

I thought that since the days of Don Ameche, fast performance over a telephone wire was what occurred at approximately 7 P.M. on Saturday night when you had to arrange a date for your girlfriend's cousin who just arrived from out of town ("Making Connections: Fast Performance over Telephone Wire." PC Magazine. September 13, 1988).

John Gillis Williamsburg, Virginia

PUTTING THE PC IN ITS PLACE One reason PCs may not be used much in

the strata Bill Machrone discusses is their physical characteristics ("Getting CEOs to Use PCs," PC Magazine, September 13, 1988). They are large, unattractive, and have noisy fans in their power supplies.

The monitor is big and its color is that of equipment rather than furniture or an office accessory. It generally has wires coming out of the back, which makes it look unfinished

A more appropriate monitor would be as attractively styled as function permits, with cables that exit through the hottom of a pedestal so they could be hidden through a grommet in the desktop.

James J. Rvan Cincinnati, Ohio

As president and CEO of a corporation, I must agree with Bill Machrone that the

company ("Getting CEOs to Use PCs"). It is much faster to keep information in my head for instant recall than trying to find it in a computer. The computer will never replace a good executive secretary, who is even better than I am at keeping information organized.

How do we keep all this information in our heads? I don't know-maybe that's what makes us CFOs and executive secretaries.

> Jack Malone Uvalde, Texas

PORTABLE CHAUVINISM

On the cover of your March 29, 1988, issue, you show three men holding portable computers with the blurb "Power to Go " I notice there are no women, and no person (arm) of color. Don't you agree that it's time to stop seeing men

ture?



Suzanne Simon Hadley, Massachusetts

Well, ves and no. If you look closely at the arm bearing the gold bracelet, you'll see that it is, in fact, a woman's. Symbols of power are relative .- Ed.

CORRECTIONS/AMPLIFICATIONS

The new prices for the IBM Proprinter III and the Proprinter III XL ("Dot Matrix Printers: The Market Matures," PC Magazine, October 31, 1988) are \$699 and \$925, respectively.

The correct telephone number for Bob Mahoney's Exec PC bulletin board is (414) 964-5160 (PC Advisor, PC Magazine, October 11, 1988).

HOW TO WRITE TO PC MAGAZINE Send letters to PC Magazine. One Park Avenue, New York, NY 10016, or upload

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PC ADVISOR



Advice on peeking at program code, how to abolish cryptic DOS filenames, and help in finding the right package to solve statistics problems.

PEEKING AT CODE

Is there a better way than using DOS's DE-BUG to peek at program code? As a programmer, I like to see how the programs I use work, but DEBUG leaves me in a state of frustration time and time again.

Boston, Massachusetts

Sourcer (899.95; V Communications, 2011 Tuch Way, #200, San Jose, CA. 2012, Head Way, #200, San Jose, CA. 2012, Head Way, Walley earling the status of a program no programmer should be without, Sourcer does no intelligent for disassembling COM, 2014, gent for disassembling COM, 2014, purpose the program littings. V Communications is even offering a 30-day, money-back guarantee for those who think it sounds too good to be true.

THE LONG AND WINDING TRAIL

In your column of September 27, 1988, you mentioned two solutions for providing audit trails on a PC. I think our company provides a more elegant solution than the ones you mentioned. It's called the PC/Audit Card.

It is an add-on card for PCs, XTs, ATs, and compatibles that is designed to track the use of the machine and keep the resulting audit trail in the secure environment of the card's memory.

It also gives the extra features of password-protecting the machine, tracking computer usage, and limiting features according to the security level of the current user. The card contains its own nickel-cadmium battery and memory for the auto trail. For extra security, special screws can be purchased for securing the card in the machine and securing the machine cover.

The flexibility of tracking only the information needed, such as user, programs accessed, and access time, makes this, I think, a considerably more elegant solution than the ones offered.

tered. Ken Dobson Essex, Massachusetts

Thanks for the information. PC/Audit Card is available from Northedge Software (239 Western Ave., Essex, MA 01929; (508) 768-7660). Its list price is \$299.95.

BREAKING FILENAME BARRIERS

I use WordPerfect for word processing and Symphony for spreadsheet analysis. Unfortunately, these programs, like most, restrict filenames to eight characters plus a

 There are several programs on the market that will let you break the eight-plus-threecharacter filename barrier imposed by DOS. three-character extension. This makes it very difficult to keep track of numerous files that may be related. Are there any software programs that will let me use more than 11 characters to name a file?

Marc S. Tenan Harrisburg, Pennsylvania

There are several programs on the market that will let you break the filename barriers imposed by DOS. One that I recommend is Retreeve from SDI (Software Directions Inc., 1572 Sussex Tyke., Randolph, NJ 07869; (201) 584-8466). It allows you to use as many as 64 characters to describe each file.

Retteve is a RAM-resident program that also helps you raganize your hard disk. You can create your own ment system with a hierarchy that is independent of the DOS directory. Disks can be organized that place of the disk of the control of the disk of

price of the program is 395.

Another good one is Extend-A Name.

North Sephwar, 1877 trooper St., Ridgewill stand the standard of the stand

STATISTICALLY SPEAKING

I am a research scientist interested in ob taining software that performs statistical analysis of data of both parametric (regression analysis, for example) and nonparametric (chi square, student t, and spearman rank correlation) forms.

I'm also interested in performing surface plotting of my data and other modeling functions. What software package(s) can you recommend for these tasks, and what review articles can you suggest for my basic enlightenment on this subject?

F. Louis Floyd Strongsville, Ohio

There are several statistical programs on the market capable of performing the functions you need. One that I recommend is Systat (Systat Inc., 1800 Sherman Ave., Evanston, IL 60201; (312) 864-5670). Systat is a comprehensive statistical, graphics, and data management package

that provides a full range of univariate and multivariate statistical analyses. The latest version, 4.0, has enhanced data handling and statistical capabilities and adds the Sysgraph graphics module, a macro facility, data file import/export routines, and text editing capabilities. The list price of Systat is \$795.

If you want to "try before you buy," a personal version of Systat, called Mystat, is available free from the company. To get it, you must send a request to Systat on company or university letterhead (college students should include a copy of their IDs). Included with the disk is a free booklet. called Statistics Quiz, on how to tell if a statistics program is accurate.

Another good statistics product-one used by our PC MagNet staff-is SPSS/PC+ (SPSS, 444 N. Michigan Ave., Chicago, IL 60611; (312) 329-3300). Suggested retail price of the base product is \$795, with graphics \$395 more.

A comprehensive roundup of statistical programs will appear in a forthcoming issue of PC Magazine.

A program that specializes in 3-D surface and contour plotting is SDS (Datanalysis, P.O. Box 2364, Kirkland, WA 98083; (206) 522-1348). SDS lets you plot any scientific data that consists of a set of x,y coordinate pairs with associated z values, including topographic, geological, environmental, and medical data. The list price of SDS is \$995.

Note: Computer Foundations, mentioned in the September 27, 1988, column, was listed with an incorrect ZIP code. The correct ZIP code is 14618

ASK THE ADVISOR

Send your questions to PC Advisor, PC Magazine, One Park Avenue, New York, NY 10016. Please specify your equipment.

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CIRCLE 231 ON READER SERVICE CARD



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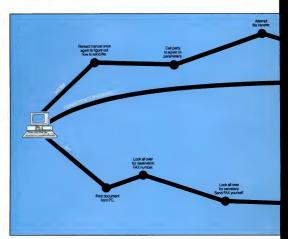
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Intel announces



Connection CoProcess

Announcing the first non-stop communications route sending a document as big as the New York phone book. between businesses anywhere in the world. Sow your faxes or files can fly cross country. And you

Intel's Connection CoProcessor."

It's a whole new way to send and receive programs, files, text, graphics and electronic messages. Not just between PCs, but with fax machines as well.

The Intel Connection is a new communications coprocessing board that frees your PC from the task of communicating.

Which means you can work on your computer non-stop — even while sending a document as big as the NewYork phone book. Now your faxes or files can fly cross country. And you can still be zooming around in your flight simulator. Or writing that letter to your biggest account. Or recalculating your spreadsheets for tomorrow's meeting. Without

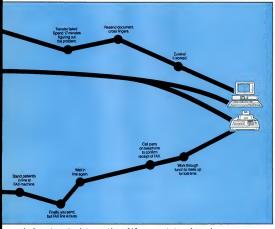
And when you fax, there are no more stopovers at the primer, or cooling our heels in line at the fax marking Recause Connection lets up

cooling your heels in line at the fax machine. Because Connection lets you do everything without leaving your PC. And when you send files directly to

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another Connection-equipped PC, you won't have to fiddle around with modern parameters or protocols. Because the Connection CoProcessor sets them for you. At 9600 bps. Best of all, Connection supports CAS, a new

Best of all, Connection supports CAS; a new communication standard that is supported by major software and hardware developers like Symanice, Borland; DCA; Microsoft; and Wordlerfect Which means you can send, for example, a word processing lite by our London office, without ever exting your Wordlerfect program. You issue send the document directly from your Vou issue send the document directly from your

application. That's it. There isn't any complicated

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FIRST LOOKS

Ventura Publisher 2.0 Adds Spot Color. Multiple Format Text Merge

HANDS ON

BY TAMI D. PETERSON With over 70 new features, Xerox's Ventura Publisher, Vetsion 2.0, leaves little need for improvement. That's fortunate. because this program is now so full-featured that the interface is an option away from being

In order to squeeze in all the new features, the Ventura Publisher programmers have created a slightly new menu convention. The program still employs the drop-down main-menu system native to the GEM environment, but menus and dialog boxes are now supplemented with what might be described as pop-within menus. A doubleended arrow icon to the right of



an option indicates the avail-

side menus deliver everything ability of some further, related from simple on/off toggles to ontions. These mouse-activated multioption hierarchical sets of

Ventura Publisher veterans will have no trouble exploring the new options and will delight in the discoveries made. New users, however, may find the seemingly endless array of options to be a maze better suited

Ventura Does Windows

to a live mouse.

Two enhancements have been made to satisfy the needs of Microsoft Windows users. Pulldown main menus can now be opted over the drop-down style. A .PIF file is also included so users can run Ventura Publisher through their Windows program. This worked well during our tests and even prevented the system from freezing when going between the two environ-

Intel Connection CoProcessor Introduces Powerful New Standard

HANDS ON

BY M. KEITH THOMPSON Sending data over telephone lines takes a lot of time and processor power. You're better off if you can do something else while your computer is moving data, but running communications programs in background mode really slows down foreground processing. This situation begs for a separate coprocessor to run the communications functions and that is what the Intel Connection

CoProcessor is all about.

transfer systems.

The Connection CoProcessor is several products in one. It is an internal 9,600-bit-per-second data and fax modem with options for 2,400-bps V.22 bis operation. It is a bundled product with single-user software for fax and electronic mail operation. But perhaps most important, considering the pricing of the product, it is a fast data and fax communications gateway that many people can share on a LAN. This product is ideal for LAN-to-LAN e-mail and file-

The importance of the Connection CoProcessor in the communications marketplace is sure to increase, because Intel joined with Digital Communications Associates to create a public-domain standard for PC communications known as DCA/Intel Communicating Applications Specification (DI-CAS). Applications written to this standard will be able to communicate quickly between PCs with little or no disruption of other processes.

Using its 10-MHz 80188 mi (continues on page 35)

(continues on page 34) HANDS-ON INDEX

HP LASERJET IID Innovative new features ... 36

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Harvard Graphics sibling. 48 STAR MICRONICS NX-1000 RAINBOW

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Ventura (continued from page 33)

ments, an irritation you grow to expect when you use them independently. We didn't perform this test with extremely large documents, however, so be sure to save your document often when trying this yourself.

The on-line help should rove to be among the more useful new features in Version 2.0. Most dialog boxes now include a small question mark icon. When selected, the icon displays another menu with help options related to the current action. There are 250 such learning messages throughout the program. With so many new features to master, even Ventura Publisher veterans will appreciate this addition.

Many new Ventura Publisher built-ins will eliminate the need to purchase certain thirdparty products made to enhance past versions. For instance, Version 2.0 now includes its own utility to print the composi-



Professional Extension imports Lotus. PRN file data directly into a tabular grid, each cell of which can be individually formatted with colors or shading.

Word, MultiMate, WordPerfect, and WordStar To further reduce outside

production setup charges, spot color printing has also been added. Ventura Publisher can print a separate page for each of six defined colors in your layout. You can choose your colors from a palette of over 62 milwith Ventura Publisher, so it operates as a completely integrated product. The only visible difference is a fifth mode seen just below the four original modes: Frame, Paragraph,

Text, and Graphics This fifth mode, Table Edit, is Ventura Publisher's answer to on-screen forms design. Rectangular grids that act as individual frames are easily structured to display numeric tables. side-by-side paragraphs, or any custom-designed form. This mode is especially useful to spreadsheet users. A Lotus PRN file import option will place spreadsheet data directly into a tabular grid, each cell of which can be individually formatted. This includes background color and shading as well as rotated text (now available in 90, 180, and 270 degrees).

Professional Extension also includes EMS support, allowing the creation of extremely large documents (up to 32MB)

and much faster operation. The other outstanding feature of the Professional Extension is the dynamic WYSIWYG equation generator, Complex mathematical equations can by typed anywhere in the text by using simple commands such as sqrt (x sup 2 + y sup 2). The results are immediately displayed from a complete set of equation fonts included for all supported printers and displays.

For \$1,295, you can opt for the new network version of Ventura Publisher Networks directly supported are 3Com, No-vell, and PC Net, and other networks can be adapted. Most standard network options are included, as well as special features like an alert that notifies a user when a file within a chapter has been modified by someone else on the network. Read-only files include Style Sheets.

Network pricing mandates that each concurrent user own a full-price copy of the product. The Professional Extension can be added to the local area network for \$595, also per concurrent user.

Of all the new features that Version 2.0 offers, you will probably be most impressed by the few that directly affect your particular business. This new version offers features to better satisfy the needs of designers, typesetters, magazine and book publishers, foreign language users, scientists, engineers, MIS managers, and even financial users. There is certain to be at least one new feature to give evcry Ventura Publisher 1.1 user a reason to upgrade. And there are a multitude of reasons for every desktop publisher to take a good look at this excellent product.



ferent formats into a single Ventura Publisher file

tion elements of a Style Sheet. This elaborate and detailed document summarizes all Frame. Color, Tag, and Tab settings.

Another especially pleasing addition, the Merge Text feature, combines word processing text files of different formats into a single Ventura Publisher file. You can also convert the combined file back into a word processor format for use outside of Ventura Publisher. Supported formats include Microsoft lion, but you want to stick to the primary and secondary colors unless you have a color printer. (Spot color printing is different from printing four-color separations, which is still a rare commodity in the desktop publish-

A Professional Addition For an additional \$595, Version

ing world.)

2.0 users can purchase the new Professional Extension. This high-end module is installed



FACT

FILE

DOS 2.0 or later.

In Short: This latest upgrade

makes Ventura Publisher

tion (standard allows for shorter

the familiar light-bar-style menus and is used to schedule and log file and fax exchanges. There is a phone book module as well as a log to keep track of who sent what to whom and how it was sent. The log also records unsuccessful communication attempts.

You'll also find an Intel-specific version of PC Paintbrush. This version has very few modifications from the original and may be used to create and modi-

may be used to create and modify fax/graphics files. The software falls short



transmission time). With its optional 2,400-bps V.22 bis Hayes-compatible modern adapter, users can also communicate with all other compatible devices.

The speed of file transfers between CoProcessor-equipped machines is much faster than transfers between computers equipped with 2,400-bps modems. How much faster depends on the equality of the telephone line and the software you use with the traditional modem. However, since the activity is all in background mode, the major advantage of the speed is reduced connection costs.

The COProcessor board also has a round connector on the back panel, the same connector used by Apple's LocalTalk cabling scheme, Intel's tech support folks say that the connector is 'mof functional at this time.' Obviously, someone is thinking ahead to making LocalTalk connections to Apple laser printers and other few vices.

At \$995, the coprocessor comes complete with software necessary to manage CoProcessor and fax transmissions and to create and modify graphics files. The connect program has

when it comes to giving users calling choices. For instance, office users often need to choose between long distance outside the area code, long distance within the area code, PBX-dependent lines, single lines, or credit card calls. The CoProcessor software gives you little flexibility in making these

However, other positive features of the software stand out. Convenient power user modes address repetitive tasks such as sending multiple files or creating distribution lists. The software reviews each name on the delivery list and sends informa-

decisions

tion the appropriate way (Co-Processor or fax).

As you would expect, the software takes advantage of EMS memory, if available.
This proves very important to memory-conscious users; the

code allowing background and unattended operation requires 61K RAM.

There is good and bad news about the add-on modern fea-

about the add-on modem feature. The good news is that the add-on modem provides reasonably priced (\$295) 2,400-bps Hayes-compatible V.22 bis capability. This modem will work with any standard communications program. The bad news is that the processor doesn't control the modern. Using the modem on the CoProcessor board takes as much processing power from the PC as using any other

Installation of the CoProcessor is simple for both novices and experts. If you are wary of having an installation program rearrange your CONFIG.SYS and AUTOEXEC.BAT files, you have nothing to fear here.

The software installation program allows the options of altering the batch files or not. It also allows the user to define the disk drive and subdirectory used for program and associated data files. The setup program gives the user such custom options as distinguishing the default fax cover page from primary text and specifying custom colors. Several I/O addresses are available, as well as two DMA (Direct Memory Access) channels (1 or 3). There are less-capable but

adequate fax cards that cost much less than te Intel Connection CoProcessor. But the real advantage of this type of product is seen when the Co-Processor is shared in the work-group environment. Intel is building a cader of companies that support the CoProcessor. ALONIFAX IO from Alcom and Higgins To: FAX from Conceits Systems. 41

low all stations on a LAN to

FACT

Intel Connection CoProcesse Intel Corp. Personal Computer Enhancement Operation 5200 NE Eliam Young Pkwy. Hillsboro, OR 97124 (503) 629-7402 List Price: \$995; optional 2,400-bps Hayes-compatible

modem, \$295.

Requires: 480K RAM; IBM
PC, XT, AT, or computible;
hard disk; graphics display

hard disk; graphics display (mouse recommended); DOS 3.0 or later. In Short: Combined fax and

in smort Companies the and communications using multiple processors to enhance micro performance. Utilizes the newly announced DCA/Intel Communicating Applications Specification.

CIRCLE 440 ON READER SERVICE CARD

share the Connection CoProcessor. Each user can send and receive e-mail, data files, or fax images through the CoProcessor gateway.

The combined backing of Intel and DCA seems to guarantee that the Intel Connection Co-Processor will get the attention of the industry. This should foster products that include the value of communications without the overhead. [28]

DCA/Intel CAS Promises No-Sweat Fax

The DCA/Intel Communicating Applications Specification (CAS) is designed to make communicating easier for you. The specification describes how application programs can send data to the Intel Connection Co-Processor and other DCA/Intel communications devices for automatic transmission. If autors of programs as diverse as

automatic transmission. If authors of programs as diverse as word processors and CAD packages follow this specification, their programs will be able to send data through a communications port as easily as they

now send data to a printer.

A CAS software component

called the Resident Scheduler receives data from an application and uses its stored information to route the data out the best way. In this release, CAS only knows about the communications alternatives on the Connection CoProcessor. Later releases will use IRMA mainframe links as a transmission

DCA and Intel promise CAS interfaces designed in add-ins and future releases of popular packages including Lotus 1-2-3, SideKick Plus, WordPerfect,

and Q&A.
—Frank J. Derfler, Jr.

HANDS ON

BY FOWARD MENDELSON

Print a page with the Hewlett-Packard LaserJet IID and you'll have something to look at when you turn the page over. Hewlett-Packard's new \$4,295 laser printer automatically prints on both sides of the paper. No other desktop laser printer can perform this feat, nor can any other printer priced as low as the HP LaserJet IID.

Hewlett-Packard is shipping the LaserJet IID now, and you don't have to wait for the next

from the second paper tray, and the envelope from the automatic envelope feeder. A task that used to call for awkward papershuffling can now be performed

entirely from the keyboard. The HP LaserJet IID is an evolutionary upgrade from the Series II, still available at \$2,595. At the heart of both printers is the proven Canon SX engine, with its clean, dark 300dot-per-inch output, operating at the same rated speed of 8 pages per minute. The HP LaserJet IID looks like a Series II

that hatched a clone of itself and

is now sitting above it. The general layout of paper twin font-car-



In addition to duplex printing, the HP LazerJet IID sports two 200-page paper trays and an optional envelope feeder (not shown).

version of your word processor [to put the duplex printing to the test. Just plug in the printer. press the front-panel buttons to turn on duplex printing, load any software that works with the earlier Series II, and start printing on half as much paper as you needed before.

The HP LaserJet IID comes with two 200-sheet paper trays and can be fitted with an optional \$350 envelope feeder. A few simple software commands let you print the first sheet of a letter on both sides of your letterhead, the remaining sheets on both sides of blank pages taken and connectors is the same, but the body of the printer has doubled in height, and its weight has increased from 50 to 74 pounds.

Because the Canon engine can't print both sides of the page simultaneously, the HP Laser-Jet IID uses a scheme that seems to have been designed by Rube Goldberg. After printing the top side of the sheet, the printer ejects the page into the rear paper tray, then pulls it back through a special paper path to print the bottom side. The page is finally ejected into the top paper tray, where it rests facedown in the correct order. It looks a lot less improbable than it sounds, and it works reliably with any standard paper up to a weight of 24 pounds. The whole process adds less than 10 per-

cent to the time needed to print a You can tell the HP LaserJet IID to print a file so that the duplex pages are arranged for binding on the long or the sbort edge, and for calendar- or bookstyle reading. You can choose these options from the front panel, but printer drivers now in development will soon make duplex printing options available from within all major word processors. A new WordPerfect 5.0 printer driver is ready now, and drivers for other programs

will follow quickly. The optional envelope feeder bolds 50 envelopes, sits on top of the upper paper tray, and takes electrical power from a small plug at the side of the printer. If you don't need this \$350 option, you can still feed envelopes manually or use the same \$85 en velope tray (capacity 15) available for the Series II. But the new feeder is more reliable than the old tray and will pay for itself in convenience

Compared with the HP LaserJet Series II, the IID adds a little bit of everything. In addition to the internal 10-pitch Courier, Courier Bold, and Line Printer fonts in the Series II, the IID adds Courier Italic and 12pitch Courier fonts in normal, italic, and bold. The printer also comes with HP's S2 font cartridge, with 8- and 12-point Times Roman and 14-point Helvetica. All soft fonts and font cartridges that work with earlier LaserJets can work with the

The HP LaserJet IID automatically rotates any portraitorientation font into a landscape font, whether the original font is from a cartridge or soft font package. This means you can clear all your landscape soft fonts from your hard disk, and

FACT

HP LaserJet IID Hewlett-Packard Co Contact your local Hewlett-Packard dealer List Price: \$4,295; optional envelope feeder, \$350 In Short: A fast, high-quality laser printer with duplex printing, two paper trays, and optional envelope feeder. CIRCLE 450 ON READER SERVICE CARE

you won't need to buy any landscape cartridges. The one slight disadvantage of this scheme is that the printer uses extra memory for the rotated version of a font and has no way of telling your applications that you've used that extra memory. The result may be an "Out of memory" error message, which you can cure by downloading fewer fonts or buying an add-on memory board with LMR to 4MR of extra RAM. The HP LaserJet IID comes equipped with 640K RAM-up from the 512K allotment in the Series II-but the extra memory is used internally by the printer, so the same 395K available to the user in the Series II is available in the IID for either downloaded or rotated fonts

Although the HP LaserJet IID includes a slot for an alternate I/O interface, it won't accept the video interface that was used to attach add-on PostScript boards to the Series II. None of the PostScript boards designed for the Series II, such as the OMS JetScript, will work with the IID. You can count on thirdparty vendors to fill this gap with new products. And a recent announcement that Hewlett-Packard has licensed PostScript from Adobe for hardware addons suggests strongly that HP will supply a PostScript adapter of its own before long.

Until now, the LaserJet Series II has been the printer of choice for fast, sharp, quiet, reliable printing with almost universal software support. The HP LaserJet IID provides all these features-in duplex.



s much as Glyphix users like our product, most of them don't rake the time to write us letters. Professor Fessler did. He bought our WordPerfect

5.0 Font Manager and three font sets and he wrote...

"After one week of experimenting with the Glyphix Font Manager and fonts, I was able to free nearly twenty mbs of disk space. I simply deleted your competitor's soft fonts! In addition, the fact that I no longer have to sort through that enormous WordPerfect font directory and then wait for the selected fonts to be downloaded is a blessing for which I give daily thanks."

The Professor even gave us some marketing advice. "Your advertising concentrates upon the initial dollar savings involved with the purchase of the Glyphix solution. The claim is undoubtedly true, but from the perspective of a user the ability to free massive amounts of disk storage space and the ease of use are the true utilities of your superb product."

Well, as you can see we have taken the Professor's advice. And by letting us quote from his letter he even cut our advertising creative costs, all of which helps us to continue to offer Glyphix at its incredibly low price. So take advantage.

If you are a WordPerfect or Microsoft Word user, our font management software can work wonders for you too. It builds drivers and adds them to your standard list of fonts. Then you

WordPerfect 5.0 A True Story.

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WordPerfect Office Desktop Organizer Includes E-mail . Group Scheduling



BY M. KEITH THOMPSON WordPerfect Office is WordPerfect Corp.'s answer to groupware-software that focuses on

increasing the productivity of groups, not just the productivity of individuals. The package includes all the features of Word-Perfect Library, including DOS menu manager, calendar, notebook, file manager, calculator. macro editor, and DOS text editor. The package also includes programs especially for workgroups-a group scheduler and e-mail. All of the programs follow the menu layout of the WordPerfect word processing software

Finding the Time

The key function of WordPerfect Office is sharing. The programs make it easy to share names, notes, mail, and each other's time over a LAN. Office does a particularly good job of helping people in workgroup environments share office resources.

When you schedule a meeting, you name the people and resources-such as slide projector, office scanner, or 25-inch monitor-that you need. Each resource must list one person as its manager. The program examines the calendar for each person and resource and shows you open and conflicting times by putting check marks and open spots in a calendar on the screen. Once you select a time and date, the program asks each person and the manager of each resource to confirm the scheduled meeting.

Of course, no scheduling program is effective if people don't keep their calendars updated. Office's easy-to-use calendar should help keep the calendars up to date. The calendar allows you to specify the frequency of time/line entries (every 5 minutes, 30 minutes, and so forth) and includes a 255character memo field for re-

minders. An auto-date schedule | feature lets you use any formula imaginable-like "every Thursday that falls on the 23rd of the month"-for specifying regularly occurring events.

ory manager that allows for multiple program residency and transporting data between programs. WordPerfect Office can also automatically record your keystrokes and log the time that The e-mail package in you spend within each program. WordPerfect Office lets you at-



The WordPerfect Office scheduling screen displays available and conflicting times for the resources and people requested for events.

tach binary files, forward messages, establish mailing lists and easily reply to incoming mail. If you need it, the package provides you with a list of user names and lets you quickly mark the addressees. In a nice extra, the package also includes a phone message form for quick notification of calls.

The Office notebook is multiuser in the sense that if a file is being accessed, any concurrent access is read-only. The biggest drawback of the notebook is that it doesn't present a directory of the notebook files. You have to remember the name of the file when you want to retrieve it.

Miscellany

WordPerfect Office also includes a calculator, file manager, network shell, and macro editor. The calculator includes financial, programmer, statistical, and scientific modes. The file manager enables users to lock files and search text files for strings. Another useful feature is the ability to display the contents of any file on the

The shell program is a mem-

The macro editor enables you to

change or create WordPerfect macros or create branching with macros.

Not Perfect

For the end user, WordPerfect Office is one of the best workgroup application packages we have seen. The overall menu system and the interfaces to each program are so easy to use that anybody who knows the position of the keys on the keyboard can use Office.

The package is not without its problems, however. For starters, we didn't find this software easy to set up or install. The network administrator must be especially careful to set the proper search paths and public files for the package. The explanations in the System Manager's Guide are useful, but we still ran into time-consuming problems

While the scheduling program makes it especially easy for users to schedule and request resources, it does a poor job of relaying the request to the resource manager. Office doesn't notify resource managers when someone has requested a resource. Instead, each resource manager must remember to check the calendar for every one of his resources on a regular

Restricted Characters

For another annovance, the manual does not mention that resources have restricted characters. When we gave a resource a name with a space in it, like "Slide Projector," the program informed us that a space was an illegal character. It seemed to allow dashes instead of spaces in a resource name. but when we tried to schedule that resource, we were told it was invalid.

And, while the e-mail package in Office provides good value for small networks, it lacks the capability to tie into other common mail systems from IBM, DEC, MCI, or Wang. It is increasingly important that a workgroup e-mail system can invisibly tie into a larger corporate or enterprise mail system.

Despite its problems, Word-Perfect Office fills the needs of many workgroups, and its ease of use-for the end user, if not the administrator-is a real plus. The program's interface should especially appeal to people who are already using WordPerfect software.



WordPerfect Office WordPerfect Corp 1555 N. Technology Way Orem, UT 84057 (801) 225-5000 List Price: \$495, first station:

\$150, each additional station; upgrade from WordPerfect Librory, \$40. Reputres: 512K RAM, networks that support DOS file-

locking feature, DOS 3.0 or In Short: WordPerfect Library reconstituted for networking

and including group scheduling and e-mail. Extremely easy to use. Not copy protected. CIRCLE 481 ON READER SERVICE CARD

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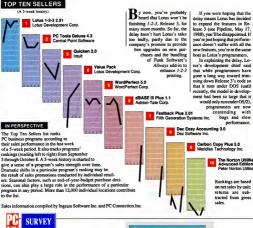
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PIPELINE



Letters from readers and visiting user roups are a couple of ways that PC Magazine editors find out what you're interested in learning more about. But PC MagNet surveys are proving to be the fastest and most far-reaching method for us to get a quick snapshot of where reader opinion stands. These questions are taken from a survey prepared by our executive editor of features, Bill Howard, to help him select story topics in 1989.



Digital Video

Were you consumed with desire as you read news reports about the stunning graphics and audio that Steve Jobs has built into the NeXT computer? Sit back for a minute. At roughly the same time next spring that the NeXT machine ships to schools, a new PC board from Intel will give you voice-quality sound with graphics that far surpass NeXT's photographic-quality black and white display -Intel's board will generate video-quality live-action color graphics.

Intel will market a Digital Video Interactive (DVI) board for roughly \$3,000 that's able to read compressed image files off CD drives and generate TV-quality images while driving external speakers via common radio-jack plugs in the board. If your PC has a multiscanning monitor and a DOS-compatible CD drive, all you'll need is the one board and the speakers of your choice.

DVI is a product of RCA's Princeton, New Jersey, research lab. It was first publicly shown in early 1987 and has since vied for respect with a similar standard—CD-I, or Compact Disc-Interactive (developed by Sony and Philips). Both give a



This DVI (Lipital video interactive) application under overappment uses video images filmed at the site of Mayan rutine in an educationel program. When Intel releases the first DVI board next year, DVI programs will run on PCs equipped with multiscanning monitors and CD drives. The video and decompression processor on the board runs at about 12 million instructions per second.

PC access to lifelike graphics and realistic sound, but DVI has the advantage of using the same high-Sierra standard CD players that are now used for programs like. Lotus One. Source, Microsoft Bookshelf, and Ziff's Computer Library. Still, DVI couldn't go far without a sponsor was willing to devote the resources to build a commercially feasible product.

GE bought RCA last year, but, lacking access to personal computer industry market channels, it let DVI languish. Intel recognized the latent potential and acquired rights to the technology in early Octo-

ber for an undisclosed amount of cash; GE retains royalty rights, but Intel has complete

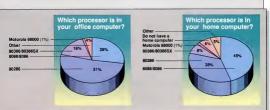
Right now, DVI hardware consists of a three-board set, that takes up four FC slets, intel plans to have the hardware reduced to a single board by the second quarter of 1989 and, amazingly, expects to have the entire configuration down to a single chip set that can be used on a PC motherboard by early 1990. Although the first boards will controughly 53,000, Intel believes DVI features will set)

for as little as \$500 in early 1991. The greatest hurdle that DVI overcomes is the vast data storage requirements of graphic files, for instance, an analog video frame at 32 by 400 pix- discontant and size an

DVI hardware does virtually spontaneous decompression, gulping images off the compact disk in advance so presentations run smoothly. Over an hour's worth of video fits on one disk. The pixel processor runs at 12.5 million instructions per second. Resolutions up to 1,024 by 512 with up to 16 million colors are post-

sible.
Lotus and Microsoft say they're going to develop DVI CD applications, and a host of smaller developers have educational programs ready now.
The success of DVI will be a

big test of Intel's clout as a standard setter, but since virtually all of the PC system and peripheral makers now look to Intel more than anyone else for standards, the odds are that DVI will make it.—Gus Venditto





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TheComplete PC

Zeos 386-25/V: Low-Cost 25-MHz Tower Packs 64K Cache, Leaves Room to Expand



BY ALFRED POOR The Zeos 386-25/V looks a lot like most of the new AT and 386 clones available in tower form. But comparing the Zeos with a typical clone is a bit like comparing the Space Shuttle booster rocket with a helicopter rotor. Zeos has joined industry leaders

such as Compaq, IBM, and

ALR in offering a 25-MHz 386based machine. But there is more to the new Zeos than clock speed. Built around a motherboard from American Megatrends, it can accept a variety of memory chips and SIM packs. Our evalnation unit arrived with 1MB of RAM made up of 256-kilobit. 80-nanosecond chips. The same board can be configured with 1megabit chips, however, and when used in conjunction with 1MB SIM packs as well, you can get a full 8MB of fast 32-bit

memory on the motherboard. If you need to go beyond that generous endowment, you can add a proprietary 32-bit memory card, which can hold up to 24MB more. The motherboard is also designed to use 4-megabit chips, once they become available in quantity, so you may never even need the expansion board.

The Zeos goes further by giving this fast RAM some help. It sports a 64K cache of 25-ns. static RAM. As a result, it turns in some of the fastest times yet on the PC Labs bench-

The system appears to be well-engineered. For example, while many other machines emulate slower clock speeds by idling the CPU, the Zeos uses a separate crystal to drive the

CPU at the lower speed. The tower case is sturdily constructed, with substantial cross beams at strategic points. The too portion of the case is dominated by a stack of six halfheight disk drive bays. Unlike most clone desktop cases, this one does not use mounting rails to install drives: you screw them

directly to the bay housing. The

back of the case has cutouts for five 25-pin connectors and three more 9-pin connectors, making it easy to place the extra serial ports required by some of the new multiuser 386 operating systems. The 230-watt power supply should also be ample for even the most ambitious expan-

sion plans. Best of all, the Zeos 386-25/V is impressively affordable. Our \$9,308 evaluation unit had a fast ESDI 157MB hard disk, a 25-MHz 80387 math coprocessor, a Paradise VGA card, a Taxan VGA color

monitor, and a base of 1MB of RAM. There are few signs that Zeos has cut corners to keep the costs down, but you'll find some if you look. For example, the VGA card is of the 8-bit variety. A 16-bit card would perform better: Compag's is about twice as fast in the PC Labs vid-

eo benchmark tests. The Zeos keyboard is not likely to stun too many buyers either. If you're looking for one of the fastest rides around at a down-to-earth price, don't pass up the Zeos. Solid construction. flexible design, and escape-velocity performance make it a tooflight choice.



Zeos 386-25/V Zeos International, Inc.

530 5th Avenue NW, #1000 St. Peul. MN 55122 (800) 423-5891 (612) 633-4501

List Price: \$6,114 with VGA, monitor, 1MB RAM, 40MB drive, 1.2MB floppy disk drive, parallel port, serial port, keyboard: \$9,308 with 157MB ESDI drive and 80387 math co-

In Short: Flexible design for easy expansion and one of the lowest prices yet for 25-MHz performance.

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Benchmark Tests: Zeos 386-25/V vs. ALR FlexCache 25386 and IBM PS/2 Model 70-A21

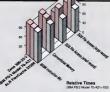
The reigning speed champion, the ALR FlexCache 25385, reteins its title, but the Zeos 386-25/V comes close enough to give it some competition. Although the IBM PS/2 Model 70-A21 performs slightly better than the Zeos in the memory tests, the ALR and the Zeos surpass the IBM in disk throughput.

Performance Times (Times given in seconds)	80386 Instruction Mix	Conventional Memory	File Access (smell record)	File Access (large record)
Zeos 386-25/V	2.29	0.31	55.26	5.05
IBM PS/2 Model 70-A21	2.25	0.30	71.49	6.53
ALR FlexCache 25386	2.20	0.27	55.07	4.98

o 80386 Instruction Mix benchmark test measures processor-intensive tasks. The test program uses 80386 instruction code. These instructions are a 80386 Instruction Mix implements a number of 32-bit operations. In the 80386 processor these become single instructions, whereas in the 8086 and 80286 versions of the benchmerk test they remain mu

The Conventional Memory benchmark test alloc 256K of conventional memory and treats it as a series of 64-byte records. Then, 16,384 random records are read into and written from this memory

throughput rate of the disk being tested. In this case, throughput times are measured in terms of how long the disk takes to perform common DOS file-manage



write, sequential file read, random file write, and random Ne read-are timed and the results summed The test is carried out for two different types of files-small-record Hes and large-record Nes-that are used by common PC applications. Files created using small records are typically used by database menagement programs, and large records are hypically used for word processing and spreadsheet files. Loading a DOS program is also simulated by the large record test

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PubTech File Organizer for Windows Adds Icons, Applications Menus



BY BARRY SIMON

Publishing Technologies' Pub-Tech File Organizer for Microsoft Windows presents an impressive and powerful alternative to the MS-DOS Executive that normally runs under

Windows First, PubTech provides a Windows manager, Commands to tile or cascade all open windows are added to the control menu of every Windows application. You can make a single applications menu that allows you to call your applications with hotkey combinations such

as Alt-Shift-A. Second, PubTech provides a full graphical interface, including icons for each file, your printer, and your disk drives. Directories are represented as folder icons. To copy a group of files from one directory to another, you open windows for both directories and single-click on each icon that represents a file you want to copy. Dragging one of the icons to the other folder copies all of the marked files. To print, you drag one of the icons to the printer. You can also delete the files by dragging one of the file icons to the gar-

White PubTech cannot display your directory structure in the ever-popular tree representation, its graphical interface surpasses the power of many other file organizers. For instance, you can act on a subdirectory, and all of its subdirec-

tories, by dragging that subdirectory's folder icon. Third, PubTech comes with a powerful editor to replace the

Windows Notepad. It has full macro control and a multisteo undo that's limited only by

memory The complete graphical interface is carried to extremes. For example, the key-redefinition screen is a visual keyboard. The only way to redefine a hotkey combination-to Alt-Shift-A, for example-is to click on the three keys. Typing the keystrokes would be as easy, if not

easier. The interface also makes it



PubTech File Organizer Publishing Technologies Inc 7719 Wood Hollow Dr., #260 Austin, TX 78731 (512) 346-2835 List Price: \$145 Requires: 512K RAM; Microsoft Windows/286 or /386, Version 2.x: mouse recommended: DOS 3.0 or later. Not copy protected

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too easy to delete entire subdirectories without quite realizing it. Move the folder corresponding to the root directory to the garbage can, and you have deleted your entire disk. The program allows you to retrieve files from the garbage can and even includes an unerase function. But that single folder in the gar-

provides no easy method of realizing that a folder contains subfolders. Despite these few shortcomings, PubTech File Organizer is an excellent file-management program. Of the half-dozen Windows managers I've tried, it is the one that appeals to me the

bage can hides a lot; PubTech

POOLER, FEE Sh filt f FEICEL.ERE Pub Tech File Organizes lets you route a file to another subdirectory or to an outset of

vice by moving the file icon to the appropriate directory or device icon.

outside of IRM

Getting a Handle on IBM's SNA

BOOK REVIEW

BY SALVATORE P.

RICCIARDI Chances are if you work for a large corporation and it's an IBM shop, then at one time or another you are going to encounter Systems Network Architecture (SNA), IBM's network architecture for distributed processing. SNA: IBM's Networking Solution, by James Martin and Kathleen Kavanagh Chanman, is a wellwritten 380-page treatment of the concepts, protocols, components, and capabilities that compose SNA.

The book is one of a select few currently available that cover this challenging topic. It is also one of the most up-to-date treatments of SNA available

For example, two entire apters are devoted to coverine IBM's Advanced Program to Program Communications and Logical Unit 6.2 protocol. Coverage includes an explanation of SNA's functional layers and their relationship to the OSI model, as well as a discussion of SNA extensions such as SNADS and DCA/DIA. Also discussed are some of IBM's software products used to implement an SNA network, such

as ACF/VTAM and ACF/NCP. Some 28 chapters cover SNA from an architectural standpoint and also include de-

tailed information on many important aspects of SNA. For example, the SDLC link-layer protocol employed by SNA is examined in detail, including message formats and protocol semantics. As such, the book is well suited to both the corporate manager needing to understand SNA at a high level and the SNA software specialist looking for an understandable addition to IBM's documentation

The book's diagrams and illustrations are frequent and extremely well designed; they're particularly valuable in helping you understand the complexities of SNA.

SNA is as obscure as it is large, and understanding it can be rather difficult. Whether you are a high-level manager needing to separate LUs from PUs or a systems-level person looking for a lucid explanation of some of SNA's trying technical details. SNA: IBM's Networking Solution is a worthwhile invest-

List Price: SNA: IBM's

Networking Solution, by James Martin and Kathleen Kavanagh Chapman, \$50. ISBN: 0-13-815143-1. Prentice-Hall Inc.. Englewood Cliffs, NJ 07632; (201) 767-5937

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PFS:First Graphics Takes Feel, Features from Harvard Graphics

HANDS ON

BY JENNIFER ZAINO
Software Publishing's Harvard
Graphic; just got a buby brother. But not to worry—no sibling
rivaly is expected to erupt between the two. While Harvard
Graphic; is aimed at the highend user, the 3149 PFS-First
Graphic; is dablet who wants to make
effective presentations at a low
price.

proce.

PFS:First Graphics uses most of the same function key commands as Harvard, and the similar meau-driven interface makes PF5 jist as easy to use. Of course, you don't get Harvard's full range of features with PFS; slide show support, draw options, clip art, arithmetical and statistical calculating options, and a spelling options, and a spelling checker are noticeably absent.

However, the package has more than enough features to keep the occasional graphics user satisfied. A fairly complete set of chart types—including text (bulleted and free-form), pie, column, bar/line, point, area, and high/low/close charts—is available, as is a 16-color palette and fill patterns. Charts have room for a title, a substite, and a footnote. You can alter their point sizes and specify other attributes, such as color, bolding, italies, and underlinding.

ing. You can also add a grid, ad-

just axis scaling, or move the

legend location.

Of course, you don't have to do any of this. You'll err on the side of safety if you stick with PFS's default size and layout choires.

You can input data directly into the program, or import from .WKS, .WK1, .WRK, .WRI, and ASCII files. You can export charts to PFS: Professional Write and Harvard

FACT FILE

PFS:First Graphics Software Publishing Corp. 1991 Landings Dr. P.O. Box 7210 Mourtain View, CA 94039 (415) 962-8910 List Price: \$149 Requires: 320K RAM, graphics display, DOS 2.0 or later.

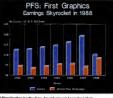
Not copy protected.

Graphics. PFS supports a variety of printers and plotters, including Hewlett-Packard, Houston Instrument, IBM, Epson, and Toshiba.

PFS.First Graphics lets you display two pies, two columns, or a combination of these in the same chart. You can also explode a slice of a pie or column and "link" it to another to show a breakdown of the elements in

the exploded slice.

Harvard Graphics is still a top choice if you need sophisticated graphics at any price, but the ease of use and preformatted layouts of PFS:First Graphics make it a good choice for the occasional eraphics user.



PFS:First Graphics has five fonts, but only one can be used per chart.

\$99 Package Safeguards System



BY MARY KATHLEEN

FLYNN

If you're tempted to put a padlock on your computer to keep
out unwanted users, you may
want to install SoffSafe instead.
The \$99 security package incorporates passwords to keep out
everyone but the people you
everyone but the people you
choose to let in. To prevent even
that trusted few from seeing
confidential files, the product

also offers file encryption.

SoftSafe recognizes one owner for each hard disk. This owner can give access to eight users, change their passwords, and see all encrypted files on the disk. If you're a nonowner user.

you're allowed to call up nonencrypted files, encrypt and unencrypt your own files, and change your password.

Designed for ease of use, SoftSafe comes with a Quick Start card that instructs you to type A:INSTALL and then follow screen instructions. If Soft-Safe can't access your hard disk, it displays an 800 tech support telephone number.

Sound easy? It should be, but in my tests the automatic installation didn't always work. At press time, Software Directions was still fixing a few bugs and testing the product for compatibility with non-IBM ma-

chines.

After it's installed, SoftSafe locks up your hard disk every

time you boot, log off, or press Ctrl-Alt-L. A screen asking for the user's name and password comes up instantly. To encrypt a file, you just put it in a subdirectory, the name of which contains the encryption word you defined during installation. All

authorized users can gain access to "safe" directories, but only the owner will be able to access other users' files. Unfortunately, you can't change your encryption word without reinstalling the program.

Whenever you boot up, Soft-Safe offers to check for viruses by comparing current system files with information obtained

upon installation.
SoftSafe, which occupies
35K RAM, supports up to 16

FACT FILE

SoftSafe
Software Directions Inc.
1572 Sussex Tpke.
Randolph, NJ 07869

(800) 346-7638
(201) 584-8466 (in N.J.)
List Price: \$99
Requires: 192K RAM, DOS
2.0 or later. Not copy protected.
ORICLE 447 DISPERDER SERVINGE CARD

disk partitions. It does not act on files in a virtual disk, but it doesn't interfere with a virtual disk either.

Once past installation, I found SoftSafe an easy-to-use tool for guarding my hard disk—from nosy colleagues as well as from viruses.

Best in our class



we had to pick just one

accounting system

for a company getting its first

computer, we would choose Bedford Integrated Accounting. Bedford is quick and easy to use, with a small number of options that limits confusion"

InfoWorld, Nov. 16, 1987

\$249 Suggested List

bedford



Bedford Software Corporation 15311 N.E. 90th Street Redmond, WA 98052 (206) 883-0074



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- C T

GRIDCase 1535 EXP Offers Removable AT Expansion Slots

GRID Systems adds the GRID-Case I 535 EXP batterypowered laptop to its line of rough-and-ready computers to take into the field. Encased in durable, black magnesium like the rest of the 1500 series, the \$7,495 machine has an 80386 microprocessor, operates at 12.5 MHz, and has aremovable tray that provides two PC-XT/AT-compatible expansion slots.

The GRiDCase 1535 EXP

comes with standard features like a 40MB hard disk, 1MB RAM (expandable to 5MB), and a 10-inch 640-by-400, high-contrast backlit LCD screen. It weighs 12 pounds (16 f pounds with the tray attached). A gas plasma display,

2,400/1,200/300 bit-per-second internal modem, and 80387 arithmetic coprocessor are all optional. List Price: GRiDCase 1535 EXP, 57,495. GRiD Systems Copp.

List Price: GRIDCase 1535 EXP, \$7,495. GRID Systems Corp., 47211 Lakeview Blvd., Fremont, CA 94538; (415) 656-4700. CRICLE 444 ON READER SERVICE CARD Computer Aids For Handicapped Users

People who have trouble using computers because of input-device inflictability can now take advantage of several software and hardware products that address these problems. PECK, a \$9.95 software package from Productivity Software International, lets users press keys sequentially instead of simultaneously. A warm reboot, forexample, can be performed without hittine the Crit. Alt. and Del to think the Crit. Alt. and Del to the computer of the control of

keys at the same time.

Radio Shack is selling a line of adaptive devices for Tandy computers. All require the \$300 PC Serial A. 1.D. Interface, manufactured by Designing Adds for Disabled Adults. The device accepts input from scanners, alternative keyboards, and single- or dual-switch Morse Code. The \$325 Unicom Estable Code. The \$325 Unicom Estable State of the S

Tektronix's Phaser CP Brings Color PostScript to Office Printers

printer controller to interpret color PostScript and the first PostScript-compatible controller that drives both color and monochrome printers, according to Tektronix. It features a Motorola 68020 microprocessor, comes with 8MB RAM, and is available configured for color (\$6 000) or monochrome (\$3,000). The card supports HPGL. Hewlett-Packard's standard plotter language, and Tektronix thermal-wax-transfer and Color Image printers. Two new printers incorpo-

rate the Phaser Card. The Phaser CP color thermal-waxtransfer printer produces A-size and legal-size color output at a rate of 45 seconds per copy and monochrome at 30 seconds per copy. The printer sells for

The Phaser Card is the first net controller to interpret monochrome upgrade costs or PostScript and the first \$3,000 extra.

At 59,995, the new Tektronix Phaser LP is the first Bsize laser printer for under \$15,000. It produces five B-size and eight A-size prints per minute, at a resolution of 300 dots per inch. For an additional \$6,000, another Phaser Card gives it color capability. List Price: Tektronix Phaser CP,

Loss revêt: 1ektronix Finser CP, 812,995 for color; \$3,000 for monochrome upgrade. Tektronix Plasser LP, \$9,995; \$6,000 for color upgrade. Either system fully configured, \$15,995. Requires: IBM PC AT or compatible. Tektronix Inc., 26600 Southwest Plwy, Wisionville, OR 97070; (530) 655-338;

CIRCLE 438 ON READER SERVICE CARD



with the new Phaser Card, can interpret color PostScript files



Picture Publisher from Microtek Allows You to Edit Grav-Scale Images

If you see the world in shades of gray, Microtek Lab thinks it has the tools to improve the view. The first is Picture Publisher, a \$595 gray-seale editing program that allows manipulation of scanned images with up to 256 shades of gray.

Users will be able to precisely crop, size, scale, and rotate images, assemble multiple-image collages, opaque, smooth, and sharpen images, and create a limitless number of gamma curves to adjust photographic highlights, midtones, and shadow areas.

Picture Publisher imports images in the .TIF file format, as well as images from Microtek's own gray-seale scanners, such as the new MSF-300Q, a \$2,495 64-gray-scale scanner that the company claims costs \$1,000 less than its nearest connection.

The scanner, which comes with either a PC-XT/AT or a PS/2 Micro Channel interface, can operate in a space-conserving, "single-bit-per-pixel mode" for black-and-white images, or a gray-scale "multibit-per-pixel mode."

List Price: Picture Publisher, \$595. Microtek MSF-300Q, \$2,495. Requires: Picture Publisher: a VGA card and Microsoft Windows. Microtek Lab Inc., 16901 S. Western Ave, Gardena, CA 90247; (213) 321-2121.

CIRCLE 441 ON READER SERVICE CARD

NEW ON THE MARKET

Computer Aids

(continued from page 51) many portable speech aids. Radio Shack also markets ability switches, produced by Technical Aids and Systems for the Handicapped Inc. An example is the Pneumatic Dual Switch, for \$220, which is operated

List Price: PECK, \$9.95 Requires: 1K RAM. Productivity Software International Inc., 1220 Broadway, New York, NY 10001; (212) 967-8666

List Price: PC Serial A.I.D. Interface, \$325. Unicom Expanded Keyboard, \$325. Pneumatic Dual Switch, \$220. Requires: All devices require a Tandycompatible computer and the PC Serial A.I.D. Interface, Radio Shack, 1700 One Tandy Center. Fort Worth, TX 76102: (817) 390-3011

CIRCLE 449 ON READER SERVICE CARD

Toshiba Introduces Two New Portables

Adding to its growing list of computers-to-go, Toshiba delivers its most powerful portables, the 20-MHz 80386-based T5200 and the battery-powered, 80C286-based T1600

The Toshiba T5200 weighs 18.7 pounds and sports a detachable, VGA-compatible, gas plasma screen with 16 gray scales. Toshiba offers two models, one with a 40MB hard disk drive (\$9,499), the other with a 100MB drive (\$10,999)

Two expansion slots help minimize separation anxiety from desktop systems-a fullsize 16-bit and a dual-function, half-size IBM-compatible 8-bit or Toshiba 16-bit. Standard features include 2MB RAM, expandable to 8MB, and a 32K static RAM cache with an



82385 cache controller. For the battery-power hungry, the \$4,999 11.6-pound Toshiba T1600 uses removable. rechargeable batteries: one is standard, but there is room for a

second one A 20MB hard disk drive. IMB RAM, and a detachable backlit supertwist EGA display are standard, as are separate ports for a parallel printer, a 51/4-inch external drive, and an external numeric keypad. List Price: Toshiba T5200, with 40MB hard disk, \$9,499; with IOOMB hard disk, \$10,999. Toshiba T1600, \$4,999, Toshiba America Inc., Information Systems Division, 9740 Irvine Blvd., Irvine.

CA 92718; (714) 583-3000. CIRCLE 440 ON READER SERVICE CARD

Toskiba's 80386-based T5200 laptop (above) has a VGA-compatible display and two IBM-commutable expansion slots. The 80C286-based Toshiba T1600 lapton (right, top) uses removable, rechargeable battery packs.

Samna's Ami Word Processor for Windows Integrates Graphics and Text

Samna is hoping to win friends among word processing software users with Ami, one of the first full-featured word-processing packages. The \$149 package is a true Windows application that offers style sheets and easily integrated graphics, according to Samna. Ami can import files in AS-

CII, .PCX, or .TIF formats, as well as files from other Samna packages, WordPerfect, and WordStar. A "frames" feature lets users create blocks of text or graphics that can be placed anywhere on a page with text wrapping around or flowing beneath them. Graphics within frames can be scaled, repositioned, or cropped For standardizing docu-

ments, users can employ Ami's predefined style sheets or configure their own Ami has two editing modes:

"draft mode," an unformatted, text-only display, and

Trainable Read-It! OCR Software Learns New Typefaces, Costs \$495 Ontical character recognition is

one weapon in the war on paper but, until recently, high prices kept the technology out of most offices. Read-It!, a \$495 software package from Olduvai, is one of several recent solutions that bring OCR prices a bit closer to earth

The package runs under Microsoft Windows and allows most scanners to function as an OCR system. Olduvai says the package recognizes proportionally spaced characters as well as monospaced characters. Read-It! comes with a selection of predefined "type tables" that allow it to recognize most popular typeset, typewriter, dot matrix, and laser printer typefaces. The software can also learn new

typefaces, enabling it to handle a virtually unlimited range of

WYSIWYG "layout mode," in which the document appears as it will be printed and text is formatted as it is entered or edited. Format changes appear instantly for coofirmation before returning to the document. Among the printing options

are portrait/landscape, reverse

order, collate, and automatic nair kerning. More prosaic features include headers and footers, a 130,000-word spelling checker, context-sensitive help, and a full Undo command. Use of a mouse is optional. List Price: Ami. \$149 until March 15, 1989; \$199 afterwards. Requires: 640K RAM: bard disk: Hercules, EGA, or higherresolution graphics adapter; DOS 3.0 or later. Includes a runtime version of Microsoft Windows, Not

copy protected. Samna Corp., 5600 Glenridge Dr., Atlanta, GA 30342; (404) 851-0007. CIRCLE 439 ON READER SERVICE CARD

various fonts and styles. Read-It! uses pattern recognition algorithms to recognize

serif and sans serif typefaces that range in size from 7 points to over 36 points. It can also recoonize mixed point sizes in the same document, as well as kerning and ligatures. Olduvai claims an accuracy rate of up to 99.5 percent

Drivers for Canon/Princeton, Microtek, and Hewlett-Packard scanners are iocluded with the package. Read-It! also reads files from any scanner that supports the .TIF format. List Price: Read-h!, \$495. Requires: 640K RAM (expanded memory recommended), 80286 or 80386 processor, hard disk, scanner, Microsoft Windows, DOS 3.2 or later. Not conv protected Olduvai Corp., 7520 Red Rd., Suite A, South Miami, FL 33143; (305) 665,4665

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FASTMICRO

1-800-441-FAST

WordPerfect 5.0



sion 5.0 adds multiple font support, graphics integration, page preview and much more. WordPerfect 5.0, still retains its

TOSHIBA /

T1000 The Toshiba T1000 is the perfect second PC! It comes with 512K

of ram, a 720K floppy drive, a supertwist LCD screen and MS-DOS in rom! much more, more trees 30, 3th roads a second second and second se

TOSHIBA ATTITUTE **Printers** These 24 pin models are loaded with features and are priced right. You can select multiple fonts

and pitches right from the menu-driven front control panel. With paper parking, you can insert a single sheet without removing the continous form paper. All this and multiple emulations with no dip switches.

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Peachtree Complete	a II 199	149	Isobar 4-6	80	42	XTree	70	34	To chark on an outler call:	607.437.89	4

\$375 Star Micronics Prints Seven Colors. Three NLQ Fonts

PP HANDS ON

BY JONATHAN MATZKIN Color makes otherwise dull output jump off the page, but for most PC users the world is still black and white. With its \$375 NX-1000 Rainbow, Star Micronics attempts-with some success-to provide a color printer that is inexpensive, versatile, and useful to a wide variety of users.

The compact (4.3 by 15.1 by 11.3 inches, HWD) 9-pin dot matrix machine performs fairly well as a basic dot matrix printer. It prints in draft quality at 64 characters per second, and NLO (near-letter-quality) print speed is a stately 20 cps. It won't set any speed records, but for personal or light professional work the NX-1000 Rainbow is fast

In addition to the draft font,

which is somewhat fainter and rougher than those of some competing machines, the NX-1000 Rainbow has three NLO fonts. The Courier typeface is about what you'd expect from a 9-pin printer, but the Sanscrif



and Orator styles are well formed and attractive. The Orator typeface prints with either normal lowercase characters or small capitals. As with the draft typeface, the NLO characters could be a bit darker, but overall, the NX-1000 Rainbow generates good-looking text output.

Of course, color output is the main reason most users would be interested in the machine. The Rainbow prints in seven colors, four ribbon colors plus three produced by dithering. But, aside from the obvious resolution limitations that go along with a 9-pin printhead, the lack of software drivers presents a

I was able to generate colorful, attractive charts using PFS: First Publisher and its Epson JX-80 color driver. The Rainbow emulates the JX-80 with good results. But a search of other graphics packages turned up relatively few that support color dot-matrix printers. One can hope that publishers will supply drivers for the NX-1000

serious problem.

Rainhow Star Micronics has neatly solved the driver problem when it comes to text. You can change text output color by imbedding FACT

Star Micronics NX-1000

Star Micronics America Inc. 200 Park Ave., #3510 New York, NY 10166 (212) 986-6770 List Price: \$375 Requires: Graphics package with NX-1000 or Epson JX-80 driver, parallel port. CIRCLE 432 ON READER SERVICE CARD

simple commands into any word processor document. These commands can also change fonts or invoke enhancements such as boldface.

The Star Micronics NX-1000 Rainbow is a good allaround printer for home users, students, or professionals with moderate printing needs. Its color print features allow you to spruce up documents and generate nice-looking graphics provided you have the appropriate

Make Your Word Processor Feel at Home with Laser Fonts

HANDS ON

BY EDWARD MENDELSON Why spend \$199 on a soft font installation program when WordPerfect Corp. or Microsoft will give you Bitstream's Fontware package for nothing when you buy WordPerfect or Microsoft Word

SoftCraft's Laser Fonts, Version 4.0, gives you plenty of reasons. Unlike Bitstream's Fontware, Laser Fonts doesn't create soft fonts, but it installs into WordPerfect or Word any soft font from any vendor or font-generating program. WordPerfect users can also install fonts with specialized symbol sets and use the same fonts in sudtiele applications

Fonts installed by Laser Fonts work exactly like the ers that come with WordPerfect or Word. You can choose the new fonts from the word processors' font menus and download them automatically at print time. Unlike all other font-management programs, Laser Fonts adds soft fonts to existing printer drivers, so you can use any soft font in the same document with any of the Hewlett-Packard

internal fonts. Laser Fonts can create outline and shadow versions of any soft fonts and install them in the same way it installs standard fonts. The package also comes with utilities that capture graphics images for printing in Word-Perfect or Word and that convert graphics files awang PIC, .PCX, and .TIF formats. You also get some sample soft fonts

LaserJet's standard-cartridge or

and a downloading utility for WordPerfect users get extra

benefits, such as automatically installed kerning tables and automatic translations of special symbol sets into WordPerfect's elaborate character set. Until now, you couldn't use the same soft fonts in WordPerfect and in PageMaker or Ventura Publisher because each program uses a different symbol set. Laser Fonts lets WordPerfect access all the characters in PageMaker and Ventura fonts-or any other standard font-and does the job transparently to the user. With SoftCraft's \$99 licensed version of Bitstream's Fontware, you can create your own custom

symbol set for technical or for-

eign-language use, and let Lo-

ser Fonts install it automatically

into WordPerfect.

FACT

Laser Fonts, Version 4.0 SoftCraft Inc 16 N. Carroll St., #500 Madison, W153703 (800) 351-0500 (608) 257-3300 List Price: \$199 Requires: 512K RAM, DOS 2.0 or later. Not copy protected. CIPCLE 433 ON READER SERVICE CARD

SoftCraft's installation programs used to force you to learn incomprehensible commandline switches, but Laser Fonts 4.0 is entirely menu driven and works with a mouse or keyboard. Although soft fonts remain by far the most confusing element of word processing. SoftCraft's new installation and control programs make them more comprehensible and manageable than anything else on the market.

"Most people we meet who give Paradox a try, end up switching to it"

Mark Cook and Steve King, Data Based Advisor



Here's what Data Based Advisor had to say about Paradox:

"You'll find creating a Paradox database easy . . The real test of a DBMS isn't how easy it is to enter your data, but how easy it is to query that data, rearrange it, and perform calculations with it.

"The Paradox Query by Example (QBE) system allows you to easily structure queries from two or more databases . . . "

Even novices create applications without programming

"Any Paradox user, even a novice one, can easily use the Personal Programmer to generate menu-driven Paradox applications ... The Personal Programmer works well all the time, even with long, complex applications. We found it can really simplify application application development."

"Finally, as the frosting on the applications developer's Paradox cake, it'll only cost you \$9.95 to buy the run-time version of Paradox to distribute (unlimited) copies of your application."

Macros save programming time

"What's really nice about Paradox, macros is this: the program records them in the Paradox Application Language (PAL). Once you've recorded a macro, you can name it, save it, and re-use it. But best of all, when you start programming with PAL, you can include your macros as part of your PAL code, really saving programming the progra



For the dealer nearest you or a brochure call (800) 543-7543 CIRCLE 377 ON READER SERVICE CARD

Paradox gives you true concurrency on your network

"You'll find using Paradox on a network is exactly like using the standalone version. The real power of the Paradox NePack shows itself when you simultaneously access a database being used by other poole ... The program elegantly handles all the program elegantly handles all the with little or no fort by network users. Along with allowing you to almost instantly see changes made by other users, Paradox has very powerful automatic record locking festures."

Report Generator is a joy to use

"If you've ever suffered with creating dBASE III PLUS reports, you'll find the Paradox Report Generator a real loy to use ... The Report Generator allows you to create headers and footers and to place fields wherever necessary to get the appearance you want."

Paradox is the one we choose!

"One of us is a confirmed Paradox user who has used the software since the beta-version of Paradox 1.0. The other just learned to use Paradox for this evaluation; he's decided to give up dBASE and switch."

Excerpts from Mark Cook and Steve King's review of Paradox in Data Based Advisor, January 1988.

See your Paradox dealer today

Your dealer can tell you more about the Paradox that's right for your environment: Paradox 2.0 for standalone or network users; Paradox 386, optimized for your 80386based hardware; or new Paradox 05/2, coming soon to eet the most from 05/2!

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System Sleuth Solves System Mysteries



BY LORI GRUNIN
System Sleuth, DTG's new
\$149 diagnostic utility, is a useful program for anyone who
needs to know anything about a
system's configuration. It also
lets you peer into the dark recesses of memory to see why
two TSRs have each other in a
hammerlock.

Initially, the program displays a system overview, which includes descriptions of the processor, ports, and ROM BIOS manufacturer and date. A map of installed memory also ap-

pears on-screen.

Through a series of menus, you can investigate the physical characteristics of the hard disk, get details about the display or I/O cards, or examine the contents of memory in ASCII or

hexadecimal format. Where applicable, System Sleuth reports segments, offsets, load addresses, and interrupts.

One particularly useful feature is the TSR table. It lists Sleuth's report generator will

each TSR with its segment address, memory usage, and

hooked interrupts.

For those who keep track of more than one system, System



and the first of the second second second second

come in handy. It produces a printout of any combination of diagnostics, leaving you space

for up to 15 lines of comments. Entirely menu-driven, System Sleuth supplies on-line help. You'll need to open the tersely written manual only for clarification of such items as I/O card memory segments, load addresses, or a brief discourse on processor architecture. And because it's a purely diagnostic program, System Sleuth won't

let you alter anything on-disk or in memory.

If you have to resolve program conflicts constantly or diagnose hardware-software in compatibilities, System Sleuth could prove a helpful addition to

your software toolkit. List Price: System Sleuth, \$149. Requires: 256K RAM, DOS 2.1 or later. Not copy protected. DTG, 23704-5 El Toro Rd., #348, El Toro, CA 92630; (213) 987-2000.

CIRCLE 434 ON READER SERVICE CARD

Squint-Free Laptop Cursor

HANDS ON

BY JONATHAN MATZKIN
The invention of the laptop was
a red-letter day in the history of
eyestrain. While the most expensive laptops do offer excelent screens, the more affordable models tend to have
plain—as in not backlit—displays. So for many of us,
squinting at a low-contrast display goes with the territory.

No-Squint Laptop Cursor, a \$39 utility from SkiSoft Publishing Corp., is designed to make working with these lessthan-ideal screens a little easier. No-Squint replaces the hard-

ware cursor on machines like the Toshiba T1000 with a larger, square cursor. To make it even easier to see, the cursor blinks at one of nine user-selectable rates, from a lazy on-off to a nervous near-blur.

To run the utility, you type LCD X at the DOS command line, where X is a number between 1 and 9 that specifies the blink rate. The numbers can be replaced with descriptive com-

mands like "LCD very slow."

You can also return to your machine's hardware cursor with an LCD OFF at the command

The larger, blinking cursor is definitely easier to see than the standard sliver that my T1000 offers. In particular, 1 found it easier to locate on screens full of text. If you use a difficult-to-read laptop regularly, and often lose track of your cursor, No-Squinr will help solve the problem. My only complaint is that the \$39 price tag seems a bit stiff for such a

modest, albeit helpful, product. List Price: No-Squint Laptop Cursor, \$39. Requires: 2K RAM, DOS 2.0 or later. Not copy protected. SkiSoft Publishing Corp., #79, 1644 Massachusetts Ave. Lexinaton, MA 02173: (617)

863-1876. CIPICLE 435 ON READER SERVICE CARD

Power in a DOS Shell

HANDS ON

BY BARRY SIMON

DAC Micro Systems' Directory

Commander, or dCom, Version 3, 12, is an interesting DOS shell and hard disk organizer. Although its file-organizing abilities are fairly standard, dCom offers other features such as a powerful macro language for programming function keys—that distinguish this product from other products in this crowded field.

Several other shells on the market—OVERVIEW and DIRWORKS, for example—allow you to define function keys so that a single program will run on highlighted files. dCom carries its programmable function keys a step further by adding an elementary language.

aCom's macros allow you to run programs, perform simple loops, and receive user input. For instance, if you find yourself frequently combining several test files into one, it would take you about 10 minutes to assign the task to a function key. You could program the key to prompt you for a new filename and then append all the tagged files to that filename.

Other nice features include dCom's robust editor and a print spooler. Written entirely in assembly language, the program is speedy. And dCom lets you unload memory-resident programs like SideKick that you accidentally called from dCom. With some other DOS shells, you have to reboot to unload resident programs.

Although it offers a lot, dCom is missing some features that are now standard. It lacks a visual tree and a command to show all the files on a drive. Despite these shortcomings.

dCom² special features make it an interesting option for those who like tinkering to get greater power in their DOS shell. List Prices Directory Commander, Version 3.12, 549. Regultres: 53K RAM, DOS 2.0 or Item. Not copy protected. DAC Micro Systems, 40941 176th St. East, Lancaster, CA 93335; (805) 264-1700.

CIRCLE 436 ON READER SERVICE CARD

"Those who are considering purchasing 1-2-3 will be better off with Quattro"

-John Waikenbach, intoworid



Here's what InfoWorld had to say about Quattro

** There are some

clear advantages in choose of the control of the co

Quattro Includes SQZ** Plus data compression A special implementation of SQZ! Plus, the spreadthest file compression utility, is built into Quattro and comes to you absolutely free. SQZ! Plus for Quattro automatically compacts and expends Quattro spreadsheets to us to 85% during file saving non criterioriae.

Combine spiritudes of an input content. I spline \$0 days of purifices this probable does not setting to object on the content of the content

Features: Improving the industry standard

"Quattro takes the industry standard and improves upon it in the areas that count most. It addresses many of the weaknesses of 1-2-3 and adds quite a few of its own unique touches."

"Perhaps Quattro's main advantage over most other spreadsheets is its minimal recalculation capability. When you make a change in your spreadsheet, only affected cells are recalculated, greatly speeding things up in most cases."

"Other Quattro features that improve upon the 1-2-3 standard include auto-record macros, vastly superior graphics, and easy installation."



Performance: Markedly superior to 1-2-3

"Our benchmark tests show Quattro markedly superior to 1-2-3 in file saves and retrieves." "Quattro's graphics are a

sight to behold."
"Quattro makes working with macros practically painless. If you're into complex 1-2-3 macros,

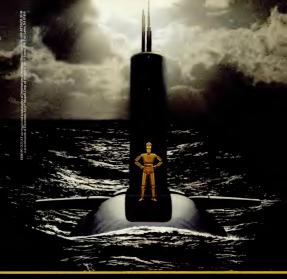
you to make the debugging feature alone is good reason to make the switch to Quattro."

"No one can argue that Quattro is

anything less than an excellent spreadsheet value. ## Excernts from John Walkenbach's

Excerpts from John Walkenbach's review of Quattro" in InfoWorld, January 11, 1988.

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It's a special Maxell edition of 688 Attack Sub, Electronic Arts' brilliant new simulation game for IBM PC/XT/AT and most companibles. You'll command a crew aboard a fully-equipped top-secret billion dollar sub. Hunt or evade intelligent foes. Thrill to highly realistic 3-D graphics (256 colors in VGA mode). It's irresistible, easy to operate and it's yours on the free 11th disk in specially-marked MD2-D and MD2-HD il-packs at your Maxell dealer. Don't delay.







PC UPDATE

by Paula Seefeldt

PC-File:dB Adds dRASE Compatibility

PC-File, from ButtonWare Inc., is now dBASE compatible. PC-File:dB, Version 1.0, provides dBASE III Plus file compatibility, full LAN support, and an increased file capacity. The graphics features now include multiple variables, stacked bar charts, and exploding pie wedges. ButtonWare is planning to also release a dBASE-compatible programming language in the first quarter of 1989, PC-File:dB 1.0 retails for \$89 95. ButtonWare Inc., Bellevue. Wash .: (206) 454-0479.

VPToolbox Expands Style-Sheet Features

VPToolbox is the file and style-sheet management system created to work with Xerox's Ventura Publisher, VPToolbox, Version 3.0, the upgraded release of the base product, has designed a report that shows every tag in a style sheet, VPToolbox/Advanced Edition has added global style-sheet editing and dBASE III exporting. VPToolbox/Network Edition supports file sharing in conjunction with the network version of Ventura Publisher. Version 3.0 retails for \$99, and Advanced Edition is \$149. The Network Edition will ship in January. System Network Architects, Princeton, N.J.: (609) 799-9605.

Excel 2.1 Accesses More Memory

Microsoft Excel for Windows can now access un to 45K more addressable memory. Version 2.1 also includes a technical manual, a Dialog Box editing utility, and support for 66 addition-



Microsoft Excel, Version

for Version 2.03 users and \$25 for Microsoft 2.1, uses a Di-Windows/286 or /386 2.1 users. New packages alor Box editretail for \$495. Microsoft Corp., Redmond, ing function. Wash.; (206) 882-8080.

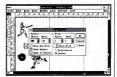
Tax Ease **Expands State** Support

Tax Ease, the tax preparation package, is extending its service to an additional five states. Also, Tax Ease Professional has added another ten states to its service list. Tax Euse retails for \$79.95 and Tax Ease Professional is \$119. Park Technologies Inc., Clifton Park, N.Y.; (518) 877-5881

al printers and color plotters. Upgrades are \$35

Accepts

Micrografx has reworked its Windows Draw program. The new Draw Plus uses contextsensitive help, scanned images, ruler snap mode, and eight color palettes with more than 100 colors. In addition, Draw Plus can connect and fill irregular objects and select, identify,



New additions to Draw Plus include rater snap mode. and recall symbols. Upgrades are available to registered users of Windows Draw for \$149.95. New packages retail for \$395. Micrografx, Richardson, Tex.; (214) 234-1769.

XyWrite III **Plus Supports** LAN

XyQuest's XyWrite III Plus is now LAN compatible. XyWrite III Plus for Networks supplies multiple-user redlining that records the user's log-in date and time. The network version also has a memory management capability, a long directory feature, and a simplified printer selection. File Server versions retail for \$795, and node versions are \$195 each. Xy-Ouest Inc. Billerica Mass : (508) 671. 0888 . . . Time Line, Symantec's project ma agement software, now offers network

support. Time Line 3.0 is available at \$595 for a file server version, with individual LAN packs retailing for \$195. Symantec Corp., Novato, Calif.; (415) 898-1919.

Lowers Prices

Citizen America has lowered the prices of six of its dot matrix printers. Printers included in the price cut are the Citizen MSP-40, MSP -45, MSP-50, MSP-55, and the Citizen Tribute 124 and 224, Citizen America, Santa Monica. Calif.: (213) 453-0614.

TECH* e "Rrowree Binary Engineering is shipping Version 3.0 of TECH*GRAPH*PAD, the engineering data software. New features include a worksheet "browse mode," an improved interface, and user-selectable color control. In addition, Version 3.0 reads and plots unlimited data points, uses "scroll-and-pick" file functions, and creates .PIC graphics files. Upgrades are available for \$99; new packages retnil for \$395. Binary Engineering, Waltham, Mass.; (617) 35-0900.

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293 Plus 240 CPS, 100 NLQ	Plus Hard Card 20
393 450 CPS, 120 LQ925	Priam 60 mb AT
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CIRCLE 481 ON READER SERVICE CARD

Next Month: How to Treat

Impacted Foot in Mouth From "Understanding Laptop Computers," an article in the August 1988 Dental Economics magazine:

"Future laptops may be 80386-based and capable of even more power and memory storage. Primary memory storage residing in tiny, integrated circuits encased in packages of plastic or ceramic permit the laptop to store and read data.

"Floppy disks provide secondary memory storage permitting the laptop computer to store data when data is not being used.

"Optional laptop hardware may include a metal or hard disk permanently sealed in its disk drive Future laptop compu may have hard disk drives of from 20 to 40 megabytes engineered to accommodate high-density, 1.44-megabyte floppy disks. Such machines would have enormous capacities for memory storage.

"The display screen accompanying a laptop computer is its primary means of visualizing information.

News Flash

Newer Math

"IBM Corp. began making computer chips from the biggest wafers in the industry-platters that are 8 inches across, or about the size of a flying disk."

-Business item, printed in full, The Charlotte (N.C.) Observer, May 26, 1988



Or would you rather have a free copy of Turbo Linhanine? (Civic Computers ad in the San Jose Mercury News)

""Eighty to ninety percent of solving a problem is defining it precisely,' says Nat Cannon, CEO and founder of Imsatt Corporation, in Falls Church. Virginia, and developer of the Advanced Help System. 'Field technicians spend 70% of their time diagnosing problems and 40% fixing them.

-Information Center magazine, July 1988

Truth in Advertising

When you quit out of that accessory, the [Lotus Metro 1.1] Swapper returns the borrowed memory to disk, restoring RAM to its original state. You can

now use the extra money for other, more productive tasks." -Lotus Metro 1.1 upgrade information sheet



Atari, the no-sweat computer solution. Advertisement in the Ottawa (Ontario, Cana da) Cittzen, June 3, 1988

New Math

tive?

"Are you tired of searching through four manuals to find the answer to one question? Do you and your co-workers feel pressured to become more produc-

"Massoglia & Associates Inc. has five new publications in the M&A tradition to help you find the answers to your questions quickly and easily.

-Fiver from Massoelia & Associates, purveyor of System 36/38 publications and prod-



CORP. COMPUTERS' SURE OF STRANGET DOWN THIS ASSE LINE, YOU COME TO THE BOOM SIGNADS DUCK HAVEN BOOM, HER RESET AND OF TO THE GAPT. BOOM HAVEN A OUT BREAKING BOOK WITH MIS TEXT, SHAT'S WANNEST COMPLETE, OF SHOUTHERS OF SHAT WAS AND EXCHAIN ON HE LEFT, BIT WATCH OUT FOR COMPUTERS OF SHAND SHOUTH ON HE LEFT, BIT WATCH OUT FOR PROCEEDINGS OF ALL OF THE PROCESS.

Swree suppressors, separate circuits, and dual quad autlets in every room? Ad from Morris/Sussex/Warren County.

(N.J.) realty booklet, July 13, 1988.

Make Them Feel Like They're Special "Analyst/Programmers, RPG II/III (To 25,000 pounds + Pack-

age): Our client, an International Bank, is looking for high calibre people within a commercial background. Applicants are of no real importance although general accounting experience etc., would be an advantage. You will be involved in new and exciting projects from design through to implementation.

-Help wanted ad, Computing magazine, (London, England).

June 4, 1987

Have you seen anything offbeat or unusual about the computer industry? Send submissions to Communiqués, PC Magazine, One Park Avenue, New York, NY 10016, Contributors receive \$50 and a PC Manazine T-shirt. Sorry, but any unused entries connot be acknowledged.

Winners for this issue: John Bacher (free power surge), Victoria Spender (ideal for computers), Paul Childs (mouse pores), Peter Kreutzer (Metro), Dr. Joseph Levine (laptops), Jim Murdock (five new publications), Phillip Busler (70% plus 40%), Hugh O' Neill (applicants not important). Jim Chamberlin (flying disk)



		VACEMENT SC	Microsoft Project 4.0	Superproject	Time Line 3.0
Pl	ROJECT MAI	Harvard	Project 4.0	Expert 1.0	Excellent
	(weighting)	TPM II 2.0	Good		Very Good
erformance	(weignicing)	Good	Very Good	Very Good	Very Good
Continues Taxibility	(75)	Satisfactory	Good	Very Good	Excellent
Recalculation speed		Satisfactory	Very Good	Very Good	Very Good
Leveling speed	(50)	Good	Very Good	Good	Excellent
Documentation	(100)	Very Good	Very Good	Very Good	-
Ease of learning	(125)	Good	Very Cov	T	Very Good
Ease of use	(150)	-	Very Good	Very Good	Very Good
Error handling	1000 20	Very Good	Good	Good	THE RESERVE
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COMPUTER BUYERS SURVIVAL GUIDE



You thought your job was tough. Well, it just got tougher. 1989 is shaping up as the most confusing year yet in the personal computer game.

If buying PCs were easy, everybody'd be doing it. Truth is, it's contissing to the point of scariness. The sourcises of confusion haven't changed: new software, faster hardware, and a battle royale over standards. In addition to classic AT architecture and the Micro Channel, we now have the prospect of EISA (Enhanced Insulys Standard Architecture) machines. And fast 286 machines nearly equal the 386 boxes in performance.

In 1989 you'll have some real reasons or mo S2.1 In let, you already do. Borland's OS2 version of Paradax, for instance, lets you infleenent true distributed processing and load sharing across a network of the processing and load sharing across a network of the processing and load sharing across and the processing and load sharing across and the processing and the processing across the processing and the processing across a load balancer, sending tasks to the least-busy databatter, sending tasks to the least-busy entwork it is the computer—something to this seriously about in the coming year.

units Seriobity about in conting year, more moverage, think about how much the arguments have changed. Last year everyone was humphing about wring standards, twisted-pair vs. coax. Token-Riv gar vs. cervithing left. 1959 will be a new year with the continue of the property of the continue of the property of the prope

APPLICATION APOPLEXY It astounds me that people still get their blood pressure up over standardizing on Lonus 1-2-3 and dBASE III. Of course, they're both perfectly adequate programs, and their long-awaited next versions will be significant

advances, but they're also known quantities. Lotus and Ashton-Tate have been conducting their product development in public, as it were. Consequently, a host of other software products are waiting in the wings or already available that do as much as or more than the new versions of the market leaders.

Meanwhile, there's the mess in hardware standards. Last year, it looked as though Micro Channel and classic AT architecture would coexist for the foreseaable future. Now comes EISA, replete with the hidden message that the machines, if not the boards, you are buying today are obsolescent. It reminds me of something we head from the folks at IBM



back when they introduced Micro Channel. How well did it work for them?

Speaking of Micro Channel architecture, I was the guy who thoroughly annoyed several manufacturers, including IBM, by hailing the then-new spec as a breakthrough that only needed some second sources to succeed.

So what did IBM do? Dragged its feet for a year or so, lashed out with its lawyers, alienated its dealers in a quest for
market share, and watched in amazement
as its share dropped precipitously. Then,
wondrously, it reintroduced the AT bus.
An obvious move to build consumer confidence.

And what of IBM's fabled Micro Chanel technology partners, Dell and Tandy? Dell dropped its Micro Channel line for lack of consumer interest. Tandy first citochip delays, then got a severe and uncharacteristic case of cold feet. Is Micro Chanels omething you should invest in f'Sure, if your IBM salesman is holding your famlivas hostages.

COURSES OF ACTION In the coming year you can be high-profile, how-profile, or no-profile. The high-profile brand specifier will make see that every meahine that comes into the company is Presentation Manager-capable. That means, at minimum, a fast 286, preferably a 386, toos of memory, a 60MB or more hard, yourcy, My VGA, and amouse. But wait, yourcy, My Ceff 4.2 and half of them are still using 1-23, Release 1.1. Why do I need all that honepower?



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Like I said, high-profile.

Low-profile managers will buy for the present rather than the future. Turbo 8088s, 90-buck monochrome monitors, Hercules clone cards. These low-rent guys will get more out of their purchasing dollar than anybody . . . until they have to replace the whole installed base in a year or so. In this pay-me-now, pay-me-later market, there's no point in being timid.

Is it low-profile to stick with I-2-3 or dBASE? It depends. If you're using dBASE in List-Browse-Edit mode, do yourself a favor and switch to Symantec's O&A 3.0.

It's a completely different issue if you're developing programs in dBASE's language. There are at least half a dozen viable alternatives. If you don't have a huge investment in dBASE code already, give Clarion, Paradox, R:base, and DataEase a close look.

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■ Wall Street is gunning for the PC business

with a vengeance that's amazing.

The no-profile manager will pay too much attention to the news, thereby ignoring the facts. One of the most newsworthy items is Wall Street's colossal lack of condidence in the PC business with a vendence in the PC business with a vengeance that's amazing. I guess they can't stand to see anyone else happy, I see a disturbing trend toward confusing a comparation of the profile of

ny's fiscal success with product quality.

Sure, you don't want to buy a lot of prod-

uct from a company that's about to go down the tubes, but how do you equate price/performance with price/earnings? The financial community got burned by the computer industry back in 1984-85, when changing standards and overpromises caused deep dislocation and virtual paralysis in the mainframe and minicom-

puter markets.
PCs were tarred by the same brush, and also with the realization that the PC industry just could not continue to grow at 100 percent a year. The fallout drove some perfectly good (as well as some perfectly avail) computer companies out of business. It probably couldn't happen again today, when the replacement/upgrade market in the current installed base is bigger than the entire market in 1984.

But then, greed and fear do amazing things. Don't let it happen in your shop.



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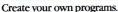




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THE AGONY OF NETWORKS



What does John C. Dvorak think about local area networks? Aside from their being the toys of control junkies and the enemies of the personal computer, not much.

Tew York Times ace technology reporter John Markoff called me recently and asked for a quote about local area networks: What do I think about them? Before I could answer he took another call, saving he'd phone me back. This gave me a chance to cheat and write down my thoughts.

I soon realized that I'm a bona fide complainer when it comes to computer networks. I scribbled one aphorism after another. Can it be that as PC Magazine turns. to connectivity and the dreaded workgroup computing, I'll be the guy complaining the loudest? (What else is new?) As the last bulwark of single-user computing, here are my "quotables" that tell you exactly what I think about networks:

- In all large corporations there is a pervasive fear that someone, somewhere is having fun with a computer on company
- time. Networks help alleviate that fear. The only thing a network is good for is to poll the system in the morning to see
- which computers were stolen. ■ They shouldn't be called networks.
- they should be called don't-works. Just as the personal computer enhances
- the efficiency and overall power of the individual, so too does the network enhance the efficiency and overall power of the MIS department. ■ The network is the last-ditch attempt to
- turn powerful standalone computers into dumb terminals. A network is the world's most expen-
- sive method for file exchange.
- In this day and age of inexpensive hard disks and cheap printers, there is no ratio-

- nale for using a network except for gruntwork invoicing and billing that would be better done on a multiuser system.
- When people talk about centralized data, I think mainframe, not network. A network is an idea that would only
- appeal to a control junkie. Network today, diskless workstation
- tomorrow, dumb terminal the next. ■ Networks introduce new forms of computer sabotage into the corporate environ
 - ment. A rank amateur can trash a network, read confidential memos, and create general havoc, undetected. ■ The network is an idea whose time has
 - come-and gone!
- Now I see they have a trade show for networks. Do we need a trade show for networks any more than we need a trade
 - show for word processing software? Networks are hot for one reason: there is a ton of money to be made selling net-
 - works to people who don't need them but

- can be convinced that they do need them. I'm amused by the number of magazines that specialize in connectivity and networks. As far as I'm concerned, once you're connected to a network you don't need a magazine.
- Who makes the most money from the network business? The guvs who make expensive cables, that's who. Now there's a
- What's the advantage of a network over a multiuser system? There isn't one, but all the confusion and the ability to mix and match parts is a bonanza for consultants.
- Find a network consultant and you've found someone who knows how to make money without doing any real work. Note:
- they always have a firm handshake. ■ Definition of the impossible: finding the consultant who sold you the network
- when it goes down for good. ■ The only six words a network service technician knows: Did you check the "T" connector?
- Sun Microsystems and Digital Equipment like to say "the network is the com-
- puter." No it's not! ■ The catchphrase "the network is the computer" is a dubious rewrite of Marshall McLuhan's catchphrase "the medi-
- um is the message." To network types this is real creativity. Both the network and the diskless
- workstation are the enemies of the personal computer.
- "Connectivity" is the right word for all this. Especially if you emphasize the

And . . . you can quote me!



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INSIDE TRACK

Borland to use new marketing tactic-insults.

I was amused to read that Sortand International wants to show better earnings, and one way it hopes to do this is to get more free publicity. In the meantime, the ad budget will be sliced down to something less aggressive. To me, this means the grand experiment—low-price soft-ware for everymea—is dead. The publicity of the publicity of the soft of t

This means the last loudmouthed bastion of low-price software will be Adam Osborne and his Paperback Software Corp. in Berkeley. Philippe Kahn of Borland will have to change his spiel to get the attention he once had by settolling low prices and ageressive mail order.

So, what's Kahn going to do in outer to get media attention? I don't know what he has in mind, thut already I see signs of a hold start—one than might backfire and hurt Bortand. Let's call if Spire Agnew marketings attack the press. My first observation of this new stacic showed itself in the Sacramento Diest Group magains, Jacra Blate, which reported extended to the start of the start of the start of the start of the August 1988 issue of Blate Notes (from the San Francisco Blate VL test Group Kahn bashed out at the press, blaming it for everything wrong with the basiners.

Some quotes:
On reviews: "Who believes that a re-

view in the press is credible?"

On analysis: "... we figured the press didn't know what it was looking at

On computer magazines: "Users group newsletters are usually much better."

He went on to blame the press for not

meaning about look-and-feel suits, although most observers had complained bitterly. He says reviewers mostly use the press lists to write their reviews and then he rifdiculed them for quoting the misinformation in the kits. He said that marketing people influence the press unduly because the press' locast lus sooftware. He rifdiculed the notions of ware. He rifdiculed the notions of ex' and ripped into PC Week gossip columnts Steeper Key.

Kahn excused himself for advertising in PC Week, saying he only advertises there because IBM employees read it—a remark that still has me confused. And he went on and on. In short, he did everything possible to insult the press in some hope of gaining its favor and attention during a cubusch in advertising.

The logic behind his approach eludes me. The press has some affinity for masochism, but this is ridiculous. In fact, as far as the daily press goes. Kahn's putting himself in a position where he may never again be contacted for a quote or an opinion except in an article entitled "What Happened to Borland?" Insults do little good in the battle for publicity. It's possible that Kahn, a Frenchman, doesn't really understand what can happen to him if he continues using this tactic with the media. Borland is too large for this kind of nonsense. It's particularly annoying when the American press gave him millions of dollars' worth of

free publicity.

Meanwhile, Kahn is avoiding the real issue, which is, What's happening to

cheap software?

More News About the Chang Modification Dept.: As many readers know there was a big hubbub about the peculiar speed-up fix done in Taiwan to make the 286 chip run at what appeared to be

40-100 AHz. I'm going to Taiwan as I write this to find out what Chang dd (If I write this to find out what Chang dd (If I handware wixant Perhaps pieced tegeths) and the control of the standard wixant wixant perhaps pieced tegeths or the items of a 286-based machine that foils most benchmark programs. That's an inter-stile garproach to performance—design to white the benchmark programs. That's an inter-stile garproach to performance—design to white the benchmark test. In Chinago I was shown a machine modified by the committee of the change modification, they made an 80256 hole as if I dictionation, they made an 80256 hole as if I dictionation, they made an 80256 hole as if I dictionate, they made an 80256 hole as if I dictionate, they made an 80256 hole as if I dictionate, they made an 80256 hole as if I dictionate, they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made an 80256 hole as if I dictionate they made and I dictionate they made an 80256 hole as if I dictionate the support of I dictionate the support of

were running near 100 MHz.

If nothing else, the Chang modification will make benchmark-test designers
more careful about how they design their
software. Everything works out for the

best. While in Chicago I talked to Art Lazere, the blustery boss at Northgate Computer Systems who, along with Mona Hendrickson, showed off still another version of the Omni Key keyboard replacement. For anyone interested: the Omni Key/102 (from Northgate Computer Systems of Plymouth, Minnesota) is the keyboard I use! The next fancy keyboard is worth a look too. Excellent product. What I like about Northgate is that instead of copying exactly what IBM does, it determines what users really want from a keyboard. Hrmmmm, there's a new concept, I wonder what would happen if IBM did that?

Good Idea of the Month Dept.: An the Month Dept. So the 5%-inch disk was format standardized the 5%-inch disk was format standardized by whyth disk testing machines don't simply format the disks while testing them. Finally! 3M is beginning to sell preformatted diskettes. If we will be sell the sell the sell disks should be sold this way because as densities increase, the time it takes to format a disk gets harder to endure.

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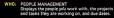
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NETWORK MYTHOLOGY



Myths about LANs abound in the network marketplace. These "LAN Lies" are doing real harm; lost time and wasted money are the results of decisions based on bad information.

etworking may be "where it's at" in PCs today. Unfortunately, too often it's also where a lot of horse-feathers and bushwa are at.

I just came lock from a conference on local area networks. One night during the conference, a group of us—corporate PC buyers, LAN specifiers, and LAN installers—gathered for a few drinks and for what turned into a verrny late-night session on what one participant called "LAN lies".

The talk in that room was sometimes arrogry, Orten hilarious. Everyone had we arrories about other people's misrepresentations and gaffes, and some of is even told about our own expensive mistakes and screw-ups. What came out of the talk was a sense that confusion and mythology about LANs are still rampant, even among some of the high-level people involved in buying, planning, and implementing networks.

One of the issues we spent a long time hashing out was the idea of LAN costs, both before and after installation. We agreed that beyond such universal problems as overpromising and underdelivering on the speed, number of users, and other performance parameters of LANs-to-be, the biggest single myth in LAN planning is that the wiring medium you choose is the biggest determinant of system cost.

I've been fighting this one for years with my corporate clients. Actually, it breaks down into two separate problems: "All That Wire in the Walls" and "Coax Costs a Bundle."

ALL WIRED UP? I can't count how many times I've been assured by a new client that this network won't cost too much to install, nor take a lot of time to bring up, "because we're going to use all that unused phone wining in the walls." This problem, of course, has gotten even worse now that we have products that deliver respectable performance on ruisted-pair—installers' talk for standard telephone wiring.

One of the great half myths of American business is that the walls of U.S. office buildings are absolutely filled with unused were pairs, all of which are neally terminated and marked as to routing and desiruation in the "deephone closer!" somewhere on the premises. It's a half-mythe because there is a lot of unused telephone wiring in those walls—usually "pulled" by people installing phones for prefer to the premise than the natural power of the premise than the property of the property of the premise that the property of the premise that the

where in the world anything went. Just as you'd imagine, while it may eventually be possible to trace where some of that wining nus and thus use it to support all or part of a network, doing so would cost a fortune—far more than puling new wire—because of the enormous amount of time it would take to track down those unused, unterminated, undocument-

ed wire pairs.

That leads directly to the second problem: the idea that cost variations among different kinds of LAN media are major determinants of the final cost of putting in the network. Nonsense.

Twisted-pair cable costs less than \$1 a foot. Coax cable costs about \$1.25-\$1.50 a foot. And even fiber optics—I can just hear some readers going "Woo-woo, this is the big one!"—only runs in the neighborhood of \$1.17 a foot.

Excuse me, but though the range is wide, no matter which cabling medium you choose, the variation from one of those figures to the next isn't going make a huge difference in the total cost of the installed network. Why? Simply because the overrhding principle of LAN media cost is that it isn't the cable that costs. It's the guy who's making \$35 an hour or more for pulling the wire through the walls who runs up the tab.

Funny? Sure. And true. On a typical LAN installation, wire-pulling labor costs far exceed the cost of the cable itself. In fact, the cost of the cable is several notches down the list, certainly below installation labor and network adapter cards for the PCs going on the net.

■ JIM SEYMOUR

VICTIMS OF MYTHINFORMATION
When we believe these unfortunate myths,
we get trapped into the wrong kind of network-planning decisions because we're
asking the wrong questions.

This happens to people who get trapped in those nearly doctrinal arguments over network configurations and protocols, too: "You've got to use a ring, not a star," or "No one uses a bus configuration any-

more," or "Ethernet is the only way to go." They fool themselves and waste time and money on answers that may be perfectly correct and at the same time perfectly useless—because they came in response

to the wrong questions.

Similarly, those who confuse the cost of cabling with the real cost of a network throw away months of time and small fortunes through suboptimal decisions based on bad information.

You may be either reassured or scared to death by the fact that even the experts sometimes still succumb to these myths and misconceptions. Certainly there was a lot of near-doctrinal disagreement in that

 Serious networking is still new enough that we shouldn't be surprised by the hype and hustle of the LAN market, nor by how tenaciously some of these LAN lies hold on.

room that night, with the Token-Ring forces battling the StarLAN people, the Novell people yelling at the 3Com champions.

HOW TO FIGHT THE HYPE If there was any single point all of us in that room agreed upon, it was that we have all spent far too much time trying to talk colleagues, clients, and customers out of things they knew they "knew," but which we knew to be fallacious and in any case wildly irrele-

vant.
Serious networking is still new enough
that we shouldn't be surptised by the hype
and hustle of the LAN marker, nor by how
tenciously some of these LAN myths and
lies hold on. But we've got to stop falling
victim to them. Asking the right questions—and demanding (and listening to)
the right answers—would be a good

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WHAT TO DO WITH YOUR OLD MACHINE?



Thinking of depositing that outdated hardware or software in the garbage can? Think again. Our readers report there could be treasure buried in your trash heap.

The results of our first annual "What to Do with Your Obsolescent Equipment" competition are now in, and we're impressed with just how resourceful you computer wizards can be. Entries from the four corners of the globe stuffed our electronic mailbox to over-flowing.

To those fine entrants who didn't win, our apologies. To those who sent in the many duplicate and obvious responses, our condolences: next time, try harder. Many, many of you suggested such tired od solutions as festing old clunkers on a secretary, child, or spouse who may previously have beneficed from a hand-me-down Commodore 64. Dozens recommended to the property of the laws. But for every unimaginative entry, there were dozen of unique, stylish ideas.

LITERARY FLAIR In the printer division, Ms. N. Allium of Vidalia, Georgia, takes the palm for her complete makeover of her moribund daisy-wheeler. Simply by removing the case and taping down the safety interlock, this creative soul transmogrified a useless behemoth into an efficient white-noise generator capable of drowning the noise of jackhammers during the recent construction of new offices outside her window; a mere flip of the self-test switch, and the sound machine blazes into action. Wasting nothing, Ms. A. also transformed the case into a solid base for the terrarium she created in the clear plastic sound-muffling cover that formerly graced the printer stand. The print wheels themselves are now tasteful and functional earrings with a distinctly literary flair.

First prize in the communications division goes to Mr. Earl Speedo, "out on Route 66," for his ingenious recycling of ancient 300-bit-per-second modems, Mr. Speedo simply mounts one of the sluggish devices in plain view on the dashboard of his BMW 735i, where the high-tech case and blinking LEDs are invariably mistaken for a radar detector. Any computer-illiterate thief in pursuit of this "Smokey Smasher" is in for a big surprise after he or she smashes the windshield and tries to peddle the ill-gotten gains. Mr. Speedo writes that he has already used three modems in this "detector protector" scheme and figures the three he has left will serve him for at least a month or two, when the 1,200-bps models he's currently using will have outlived their usefulness.

In the expendables division, "All the Gang" from Allenwood, Pennsylvania,



wins easily with its photo of a special "Merry Computermas" display. Built solely of spent laser printer cartridges, garlanded with chains of tractor-paper sprocket edges, and gaily festoened with bad-sectored floppy disks, this unusual "tree" is a sobering holiday statement about making do under adverse conditions.

LOYE COASTER The monitor division's clear victor is Mr. Alan "Squinty". Orbison of East Livetpool, Ohio. After carefully using special laboratory equipment—don't try his a home!—or remove the phosphors from the screen of his ancient CGA display, Mr. O. filled the vacuum tube with water, a dolfhouse-size computer, and a school of piranhas, to create "a traquil but pointed reminder of the seed of rechnological change."

Mr. Orbison also wins first prize in the adapter division also wins first prize in the adapter division for his creative reuse of an old full-length CGA card as a high-tech 'love coaster' that will hold two drinks at once for those romantic occasions. ''Sand the back smooth first,' recommends the licentious mixologist, ''or you run the risk

of sentething your credenza."

Ms. Landon Bridge of Tacoma, Washington, wins both first and second prize inthe documentation category. In the documentation
category in the secondsoftware manuals make excellent kindling
for log fires. In her first-place entry, she
suggests that new software manuals make
excellent kindling for log fires. Ms. Bridge
mosts that slv's gald that the competit
did not specify "used" equipment, since
h "suspects no manuals have ever activ-

■ STEPHEN MANES

ally been used." Clever, Ms. Bridge, but 1 your entry was past the deadline for our computer humor contest.

The PCjr division attracted many entries, including at least three dishonorably

mentionable litter boxes for cats. However, the judges gave the nod to a Mr. J. Sculley of Cupertino, California, who turned his orphan IBM into a combination stand that can simultaneously hold a can of

Diet Pepsi, an issue of Forbes, a tiny trash can, and an Apple Macintosh computer. A patent for this invention, he notes, has

been applied for, so infringers beware. Old 8088 machines never die; they just help with breakfast, Mr. Sinclair Bumbershoot of Scunthorpe, England, offered the most creative use by far. When emptied of their electronic components, the five expansion slots perform a perfect job as a toast-cooling rack for a four-slice toaster-a feat that no current PS/2 desktop model will ever be able to match.

With thousands of programs threatening to employ the F12 and SysReq keys any day now, old-style PC and AT keyboards are rapidly falling out of fashion. Solution? Some tin-snips and surgical tools helped orthopedist Irving Snoll of Chicago transform the input devices into Dr. Snoll's Exercise Sandals. The variable key positions conform to the natural shape of the human sole, and the weight of the all-metal devices eliminates the need for ankle weights. Similarly modified PCir keyboards will do the trick for toddlers.

sneaky "software recycling" program: simply install an old version of DOS on the disk of your worst enemy. But Mrs. Meyer Jacoby of Ossining, New York, won first prize with her novel use for original distribution disks. Her 51/4-inch "DiskDeck" includes a full complement of 52 cards plus two jokers; the 31/2-inch edition is available only as a pinochle deck because of the greater scarcity of its components. "If they'd only stop making the little ones in different colors," she reports, "it sure

One correspondent recommended a

would make things easier.' As promised, each of our first-place winners will receive a fine original-model 8088 IBM PC clone with 64K and two single-sided floppy disk drives. Runners-up get collector's-item official IBM fulllength PC memory add-on cards, maxed out with now-scarce 16K chips to a full

complement of 128K. If you didn't win this year, put on your thinking cap. This time next year, you may be amazed at how you feel about your frustrating equipment-that crawly 6-MHz 286 machine, that sluggish 16-MHz 386, or that too-tiny 80MB hard disk. The next

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TMS computers are prepared the same conscientious way I prepare Aunt B.Z's delicious pumpkin pie-one step at a time," insists T.W. "Quality checks replace licking the bowl. Every drive is burned in; every system tested. Of course, I try not to hum in my pies," adds T.W. with a wink.

During the holidays, T.W. 'Dillo is always cooking up something special. Whether it's bite-size taste treats in the kitchen or byte-size goodies in the

If there was a computer cook-off, the competition would have it rough. They'd find it difficult to duplicate the armadillo aptitude for craftsmanship "But then," quips T.W., "it's like what my father, of D.P., used to say, 'If you can't take the heat-you shouldn't be in the kitchen."

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CLASSIFIED INTELLIGENCE NAGING INFORM

o far, it's been the Lotus-led term personal information manager that people have applied to a group of about twodozen-plus products still in search of a suitable rubric. Since many of these products are more different than alike, it's hard to find a general description that covers them all. Hence it seems only fair that a coinage so closely

identified with Lotus has come into widespread use: after all, it was the promise of a revolutionary product from Lotus that propelled this somewhat sleepy software category from the realm of "nice program, for somebody in the company" to "belongs on everyone's desk." What is a personal information manager? It's a program that hopes to do for

words what spreadsheets and databases have done for numbers: allow users to enter, retrieve, analyze, and cross-reference data-first numbers, and now words-at

In the context of a business setting, there's corporate information and personal information. Corporate information includes sales data, employee salary records, and customer mailing lists: repetitive data with a stable data structure. Corporate information, primarily num-

PERSONAL

bers, is the stuff of traditional databases on mainframes, minicomputers, and now personal computers.

Personal information comprises the random nieces of information you come across every day: notes you scribble on the back of business cards, phone-message slips, plans for how you'll conduct a talk or sales pitch, management issues, your personal Rolodex, just about anything written on a Post-it, or the annotations you make

A new category of

software lets you

on a business document. Anything you empty out of your purse or suitcoat pockets at night that has writing on it probably constitutes personal informa-

bits of personal Personal information doesn't fit into rigid formats as easily as does corporate information, and across every day into it's more likely to consist of words rather than numhers or at most a mix of that mirrors the words and numbers. The information is of value to way you work. your company indirectly because-properly organ-

ized-it's of extreme value to you, and you're valuable to your company. Products that bring some semblance of order to this tangled web are called, logically, personal information managers.

IMPORTANT I Consumer Services Corp. Business Weekly (Dallas o PC Magazine First Looks department Bill Simon Gourmet Cateri .lanan-l (San Fr **Nippor** 9:00 Interveiv **PCMac** 10:00 Prepare Gutent 11:00 Lunchw Dr. Sige 12:00 Act unch at Executi 1:00 Dentist a Chambei 2:30 3-00 Checkor 4:00 Pick up L 7:30 Dinnery 10:00 Taxi Readhad Mer structure the random Prin Make plane rese Offi. Lapton, floppydisks, LA information you come Reprints of European Bu Dinnerwith attorneys at an intelligent compilation International phone call Limotoairport HotelNikko, Chicago

■ PERSONAL INFORMATION MANAGERS

You may have a personal information manager in your PC already and not even know it. Without stretching the definition too far, the term can be considered to touch on all these product categories:

- appointment calendars, time managers,
- and time trackers: text-based databases (sometimes called
- texthases) or text-retrieval software:
- outliners:
- hypermedia or hypertext:
- pop-up notepads, typically found in desktop organizers (along with calendars and phone dialers);
- contact or client management software;
- standalone phone dialers: document or file managers;
- electronic mail:
- annotation, redlining, or group-comment software.

A BIG IMBRELIA Most of these categories have been around for years; jointly they include dozens and dozens of programs. Even hypertext has been around for years-since the 1960s as a concept, waiting two decades for hardware to catch up with man's fertile imagination. (Apple's HyperCard for the Macintosh, which isn't a card at all but a piece of software, is a bit too limited to be considered true hypertext. It does fit nicely under the broader personal information manager umbrella, though.)

Older programs, especially desktop organizers such as Borland's SideKick or Lotus's Metro, do a respectable job of getting personal information into your PC. The newer breed of programs goes further and helps you pull out the data in an orderly fashion. The best programs show relationships you might not have noticed without their assistance. Used properly, they can be support tools for your decision making.

Much of the interest in personal information managers stems from an ambitious trio of products announced within the past year and shipped in the past few months: GrandView, IZE, and Agenda. All have been tabbed "personal information managers," and while each contains attributes found in the other two, they are clearly not direct substitutes for one another.

GrandView, which sells for \$295 from Symantec Corp., might be broadly defined as the most highly evolved outline proces-

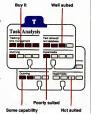
Suitability to Task

hoosing the perfect personal informa-C foosing the period period products that are more dissimilar than alike is no easy task. The unfortunate truth is that each personal information manager has a certain degree of success at fulfulling its mission in life, but that mission may be very different from yours.

Recognizing that these programs agree to disagree, we've divided this product category into four subgroups that encompass a wide range of functionality: tracking/time management, text retrieval text databases, outlining, and hypermedia. Some products exhibit capabilities in all subcategories; others specialize in only

one of the four. PC Magazine required all reviewers to

give a suitability-to-task rating based on their assessment of a program's performance in each of these subcategories. asking them to bear in mind how featu rich a program is, how well it uses the features it has, and how easy it is to learn. Although logic might suggest that a product that scores high on all counts comes closest to being the ideal personal information manager, for some users a product that eams a high score in only one subcategory will be the mo appropriate. And for products that cut across all four subcategories, the quality



and intelligence of the interface may be the feature that counts the most These subjective ratings, based on a

scale of 0 to 4, are presented in sepa indexes that accompany each review. The ratings translate as follows: 0-not suit 1-poorly suited; 2-some capability; 3-well suited; 4-buy it.

sor on the market today.

IZE, \$445 from Persoft, manages, dynamically links (that is, switches among), and retrieves documents from multiple files and file formats. The IZE dynamic links represent a partial attempt at hypertext. Among existing personal information manager metaphors, IZE fits best into the text-retrieval category.

From the moment it was announced at the computer industry's annual Fall Comdex trade show in November 1987, Agenda, \$395 from Lotus Development Corp., had a certain mystique. Chalk it up to Agenda's paternity papers: the program was hatched by Lotus founder and former chairman Mitch Kapor, former Lotus chief of technology Jerry Kaplan, and director of R&D Edward Belove-three of the industry's brightest lights. Agenda defies typecasting; it has elements of time man-

agement, text retrieval, hypertext, and a bit of outlining. Compared with IZE, Agenda is more painstaking and labor-intensive for the user, but it's a bit more thorough and accurate in its matching and grouping. Other information management prod-

ucts appeared within the past year, including Group L Corp.'s Memory Lane, Microlytics' GOfer, Valor Software Corp.'s Info-XL, Polaris Software's PackRat, and Roykore Software's Opus 1. That makes personal information management a category about to take off. Or so its backers hope.

A not-yet-released Lotus product, Notes, stands on the periphery of the personal information manager concept. Notes contains elements of a free-form database. electronic mail, and workgroup comment features. However, there's just enough

OUR REVIEWERS

Bruce Brown is a principal of Soft Industries, a microcomputer consultancy based in Southington, Connecticut. Henry Fersko-Weiss is a free-lance

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Craig Sunson is the author of Quatro: Secrets, Solutions, Shortcuts (Osborne/McGraw-Hill) and coauthor of Running Windows (Microsoft Press). M. David Stone is a contributing editor of PC Magazine.

Priscilla Tate-Austin is a senior editor of PC Magazine.

similarity of concept with Agenda to Invive comparison. As Lotta R&D bead Belove describes the two, both offer flexibility and the ability to rectalgo information on the fly, but Notes is optimized for information sharing while Agenda will remain a singleuser product. Notes requires the Presentator Manager (OSS 21.1) graphical user interface and a file server, ognodu is a with an OSS 2.10 version en route. Over time, though, the two technologies might evolve into one, says Bedove.

BACK TO THE FUTURE While hypertext only now is evolving as a real-world application, its origins date back to the end of World War II. Writing in the Atlantic Monthly in 1945, Vannevar Bush envisioned an electronic desk, Memex, with

acces to near-infinite amounts of information and the ability to find any piece of information, then jump to another piece, vietually instantaneously. Ted Nelson coined the term hypertext in 1965, and in 1968. Douglas Engelbart showed a graphical workstation that moved effortesisty both among reliated documents. Until the past year or two, bypertex has remained past year or two, bypertex has remained because the cost and processing power that it required weren't available to individual

With hypertext, information is broken into discrete components. A single file would have many components, or nodes, linked by common words or phrases to other files.

IISPIS.

Depending on your point of view, the shifty to have all related information linked is either a blessing or a curse. To proponents, hypertest promises to be a revolutionary research, analysis, and thinking tool; to critics, it's an unstructured time-waster that leads the user down the bid allegs for every useful link. Hypertest programs for the PC include O-all international's Guide and Roylover Software's Opus I; the latter is a "hyperdrawing" program.

REVIEW PROCEDURE Because the field of personal information managers is so broad, PC Magazine set saide (for this story only) the usually tightly scripted review procedures, benchmark tests, and commonly asked features-table questions that judge products by a single, uniform set of standards.

Instead, we selected four applications, or tasks, that personal information managers might reasonably be expected to perform, and we judged products on how well they fit in. These are:

- time management, tracking, or appointment calendar;
- text retrieval or a text-based database;
 outlining;
 hypermedia.
- Each task was rated on a scale from 0 (no abilities, completly unsuited) to 4 (offers all or most desirable features). Some products offer abilities across all four applications.

products were tested for ease of use, ease of learning, robustness, support, and quality of the manuals and on-line help. The 25 reviews are arranged in alphabetical order by the product's name.—Bill Howard



If you spend a good part of your day following up sales leads or setting up apclared to the sales with the sales of the conceived and tightly integrated product that includes such helpful features as a phone dialer and customizable pop-up menus, the 5395 resource-tracking program is designed to help you manage your contacts, time, and expenses.

Essentially, Act! maintains a database of your dealings with your contacts. Its basic unit of information, called a profile, can represent a client, customer, or sales lead. Each profile is described in two screens of information, which contain 96 fields; 15 of those are user definable. Standard profile data includes name, address, telephone, salutation, contact, task, and follow-up information. Recognizing that the more contacts you have the easier it is to lose track of your correspondence with them, Act! maintains a history of all interactions with each contact. For example, the program's phone dialer logs all calls made to a particular contact. In addition, Act! includes an expense log, a limited word processor for memos and correspondence, a form-letter function, and a pop-up calculator.

To help you get started, Conductor Software furnishes sample Act! files and prudently suggests that you work with them before you begin to enter real data. The manual that comes with the program is clearly written but would benefit from more screen shots of program menus. And



Act! uses customizable pop-u windows that aid in entering frequently used information.

if these study aids aren't enough, the vendor offers a \$10 VHS-format videocassette that will walk you through the major features of the program in about 25 minutes. Buying the video makes the most sense for sales departments—Actl's prime audience—which could use it as part of a sales training ocurse for new employees.

THE OPENING ACT The program has a horizontal moving-bur menu structure; customizable pop-up menus help you fill in fields. You spend most of your time in the Action menu, through which you can control most of the program's major functions, as well as edit and add profiles. The Action menu has a Write selection, which

FILE Act!, Version 1.1B KT! Conductor Software Inc 9208 West Royal Ln. Irving, TX 75063 (800) 627-3958 (214) 929-4749 List Price: 5395 Requires: 460K RAM. two florony disk drives (hard disk record mended), DOS 2.0 or later In Short: Essentially a detabase program customized for tracking people. Act! includes helpful features such as a calculator, a calendar, and a phone disler. It works quickly and well. Not copy protected PICLE 678 ON

activates a word processor. The Write selection lets you write memos and correspondence, and also has a form-letter function if you need to do a large mailing.

By offering preset and customizable menus for common data-entry chores and by letting you enter dates by pointing to a calendar, Act! saves you time at the keyboard. Once you've entered records (profiles), you can search for them individually or in groups by looking for matches from one or any combination of fields.

Act's phone dialer is intended for voice communications only. It lets you preset local, long-distance, and special dialing sequences, saving you even more data-entry time. Its history feature, an important attribute, lets you quickly record the results and required actions for both outgoing and incoming telephone calls.

Also impressive is Act!'s ability to create a week-at-a-glance-style calendar with separate columns for calls, meetings, and to-do's. Information for the calendar is taken directly from entries on the profile

screens.

Act's other major menus include Library, Expense, Settings, Database, and Uliliy, In the Library menu, any information not attached to a specific profile can be swed, such as price lists or procedures. Act's Expense menu is an annotated business-expense tracter that lets you set such items as mileage and hourly rates and choose an expense payment method. A slight drawback here is that mass are set for the entire like not the client and the or the the entire like not the client and the or the

ply to all future expenses unless they are

reset.

The Settings menu lets you customize
the way the program works and appears,
here's where you define the field labels for
the user-defined fields. The Database
menu controls importing and exporting deimited, fixed-length, or Acti Format files.
The Utility menu includes selections for
rearranging and compressing files.

THE FINALACT Act is best suited for users like sales professionals and fund-naisers whose work revolves around concing many people. Although the literature that accompanies the program suggests other uses, such as logging real estate that you want to purchase, using people would dilute its major strength—art of any policiaism so ther than tracking people would dilute its major strength—automating a contact or sales network. If that's your primary need, Act! should serve via well—Barne Brown



Information Research Corp. characterizes ActionTracker, its \$198 task management program, as "multiproject control made simple." That description falls cose to the mark. Designed more for following and integrating activities related to many small projects than for single huge ventures, the program creates a flexible database of events that can be accessed.

viewed, and analyzed in a variety of ways. You don't have to be an expert project manager to use ActionTracker. In fact, its deadline/appointment orienta*on makes it better suited to managers and professionals than to those schooled in project management methodology.

The best way to get acquainted with Action Tracker is to install its sample data and follow the tutorials. After working with



ActionTracker's date options can be coordinated with an action list entry, if requested. The violet field at the bottom warns of weekend scheduling.

the sample data for a short amount of time, you'll find the instructions in Action-Tracker's manual more meanineful.

AN INTELLIGENT CONSISTENCY ActionTracker's screens don't throw you

ActionTracker's screens don't throw you any curvebalts. Options are displayed on menu bars at the bottom of the screen or in windows that pop up as needed. Function keys control most actions and are used consistently thoughout the program. Should you get lost, context-sensitive help is always available. ActionTracker's data-entry screens are

well designed and attractive, saving you time by focusing on the task at hand rather than on superfluous details. For example, on the action-list screen, date and budget overlays are kept out of sight until you need to see them.

need to see tient. The program offers other timesaving features. An Easter Previously typed into the same field. Templates are available for entering forth-used actions, as are reminder fields that automatically insert pro four copies of an Action into appropriate daily calendrously and the same propriate daily calendrously as a same propriate daily calendrously and the same propriate daily calendrously as a same propriate daily ca

FREEDOM OF CHOICE Action-Tracker's flexible entry options allow you to tailor the system to your own work habits. For example, you may prefer to create a list of siego in a project road assign duesor personant to them inter. You may create aged time or money or both. You may create inscillancous actions that remain unassigned indefinitely. You may change dates through either action lists or calendar. Extended the significant of the significant of the significant of the significant of the force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the significant force of the significant of the significant of the

ActionTracker puts information into five data files called projects, project sources, actions, types, and resources. These terms can be defined broadly. For example, in an application for professional groups, the sources might be the clients and the projects might be the individual assignments. In an application for portfolio managers, the sources might be categories of investments and the projects might be individual instruments. Each project may have up to 100 actions, but there is no limit to the number of projects, sources, resources, or types that the program can handle. In addition, the program lets you cross-reference files, allowing a wide variety of data views. Also adding to the program's flexibility

are 14 built-in reports, which include action lists across project lines categorized by type, source, department, manager, or responsible person. You can vary the selection criteria for these reports by using



ActionTracker's filter options. For example, you might create a report with or without budget summaries, including or excluding completed items, and focusing on a particular time frame.

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protected.

EXTENDING THE POSSIBILITIES But you don't have to settle just for customized reports. If you purchase Action-Tracker with PQL, which stands for Pro-

tomized reports. If you purchase Action-Tracker with PQL, which stands for Program Query Language, you open up additional output possibilities. With PQL, you can create graphs and histograms, do custom formatting, use complex data-selection criteria, and perform ascending and descending sorts as well as other powerful arithmetic functions. This version of the program costs 2548.

All fields in an ActionTracker database are accessible through POL. You can elect, compare, total, average, export, and otherwise manipulate them to sair your purposes. PQL accepts both menu-selected and command-line instructions. You can save report screed either way. If you have even a rudimentary understandingly the database concepts, you can multiply the power of the program many times over by using PQL. NOTHING'S PERFECT For all its power and flexibility, ActionTracker lacks a few features that might make it more user-friendly and a better personal assistant. For example, it would be helpful if the program warned you when appointments overlapped or if it automatically restricted certain dates. Then, too, it would be nice if there were an automatic way to create phone or address lists; to do so now means creating your own PQL procedures. According to Information Research, an enhanced version of ActionTracker, which will be available before the end of the year, will include such new features as Gantt charts and extensive note-taking capabili-

Of course, the best way to judge ActionTracker's power and ease of use is by using the program. Why not, then, take Information Research up on its 30-day evaluation-period offer and try the program vourself?--Joy Segall



A genda, the most talked about of the personal information managers reviewed here, may be the most powerful and most frustrating as well. Agenda evolved from the personal vision of Lotus 1-2-3 developer Mitch Kapor and two other leading lights of Lotus.

What's genius to one person may be insanity to another, however, you'll find this \$395 program either brilliant or quirky. Possibly both. I did. After using Agenda for 11 months in its alpha, beta, and retail versions. I'm impressed by all that Agenda can accomplish-and still at a loss for a snappy one-sentence definition of what Agenda is. The best definition may be more of an explanation of how you use the program.

you get in the next 24 hours (your to-do list, two useful suggestions you got from your coworkers, the name of a widget vendor gleaned from a seatmate on the Eastern shuttle, an idea you saw in the Wall Street Journal), and type it into Agenda.

Do that for two weeks or a month and build up a solid body of ideas. Then chop. slice, dice, filter, and view the information. You'll manually create some of the assignments and views: Agenda will help complete others. The more you use the program, the more it can automatically complete your thoughts and assign information. The information, plus the relationships, juxtapositions, and dependencies you uncover, and the orderliness you gain-that's Agenda.

THREE NEW CONCEPTS Even if your PC experience includes years with a word processor, a spreadsheet, a database, and a desktop organizer, Agenda's concepts may require you to undergo a bit of acclimation. Agenda has three conceptual

building blocks. They are ■ Item: a single nugget of information, usually a phrase or two, such as "Meet Cogswell Ltd. marketing manager for drinks next Friday at Bennigan's," The item is your information entry. An item can be 350 characters long, with additional text spilling over to a 10K-byte note attached to each item. The entire Agenda database can be 4MB, although once your database exceeds 100K you'll probably want to use a 386 or a very fast 286.

■ Category: the way you file or organize information. Items are assigned to categories. At first, you assign items manually. As you build structure into your database, Agenda can evaluate the items and assign them to categories automatically. Agenda categories are very rough equivalents of

fields in traditional databases ■ View: the way you look at information. A view is an on-screen report of your information, filtered and sorted to your liking. The view is divided into sections. Views might be sectioned (or grouped) by sales region, by competitor, by date, by priority, or by the order you entered the items. Agenda can have as many views as you

The view on-screen can be arranged in Take every useful scrap of information | several columns. Items are always

can think to create.



grouped into one column; additional columns generally show information from the categories that aren't grouped into sections. Confused? Welcome to Agenda.

Here's an example: Your database view is sectioned (or sorted or grouped) by the companies you sell to. All the items about Cogswell Ltd. are in one section; the items about Burnstead PLC are in another section, and so forth, with one company per section. Additional columns might show the priority you attach to each item, the date you entered the information, and the names of your contacts at the companies.

ASSIGNING AND FILTERING Agenda's 21/2-year gestation period yielded an abundance of assigning and filtering tools.

If an item contains (or doesn't contain) certain information, it will be assigned (or unassigned) to certain categories. Lotus calls this "conditions" and "actions." Also, you can filter, or restrict, views to show only certain categories, or only items falling between a range of dates.

You can establish category hierarchies. For instance, you might have a Priority category with three children: high, medium, and low. Categories and their children can be exclusive, if desired.

You can use synonyms to describe the same thing, "Jeff," "JB," "Larry's successor" and "District 12" could be used interchangeably with "Jeff Bond." Agenda would recognize all five.



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Agenda allows you to enter information and then add structure as you go along. Initially you make the category assignments; then, as Agenda learns your style, it takes over the

assignments; then, as Agenda learns your style, it takes over the categorization. Shown here, a filtered view of a sample PC Magazine story database, divided into product topic categories.

Agenda's most important feature is item parsing. Using artificial intelligence techniques, Agenda skims an item for information that can be used to match items to categories, without your intervention. Agenda understands conversational dates (next Wednesday, beginning of May) and the implications of your conditions, actions, and filters. You can give Agenda three degrees of freedom in matchmaking (complete, some, a little) or turn this capability off completely, for instance, so it wouldn't misunderstand "When she plunged from the gangplank, that was the end of April" as 4/30/89. Artificial intelligence, as it is implemented here, remains a bit artificial.

Learning to use all the tools at your disposal competently takes time—a long time. It can take such a long time that some users may give up in frustration. And that's a danger, because Agenda becomes more valuable as the size of the database grows. You might give up just before you found the light at the end of the tunnel.

Agenda also shoots itself in the foot because it's a complicated program without the right training tools. Agenda includes two adequate manuals. On-line help is skimpy, there's no keyboard template, and some of the procedures (setting up conditions and actions) are downright confusing. Persoft's IZE, in comparison, steps users through its equivalent sequences in a way that makes the users more certain that what they intend is what IZE actually does. Attis Idy willout, Louts said that 12 books on Agenda were on the way; one may bail you (and Lotus) out.

TOUGH IT OUT If you stick with Agenda through the learning curve, you will be amazed at the order it brings to bear on your information. Agenda's breadth of categorizing, matching, and viewing (reporting) powers has few, if any, peers among personal information managers.

On the four suitability-to-task groups used to rate these programs by PC Magazine, Agenda shows capabilities in each area.

As a tracker or time manager, Agenda lets you keep to-6 lists, delegate tasks to subordinates, track projects, show what items or tasks deepend on other items or tasks deepend on other items or tasks along the other. It is also track appointments bourly rather day as auto-disker for phone numbers for phone numbers of the analysis. As a text-retrieval profit and adily. As a text-retrieval profit and adily. As a text-retrieval profit of the find all occurrences of phrases, use does not logic in searches, and create the equivalent of Leywords or titles.

As hypermedia, Agenda uses a somewhat different procedure from classic bypertext: once all the data is in Agenda, you can creaze views and categories that short related information. If you want to research a relationship that wasn't immediately apparent, you create an additional view. It's not as sexy as clicking a button to jump from A that's linked to B, which can be linked to C, but it's passable. Anenda provides 2½ lavers of outlin-

ing. You can see section heads, expand to show items, and expand further to see the note behind an item—but only one note at a time. Categories, however, can be nested 12 deep.

TEXT BETRIEVAL If you want to analyze large chinsks of existing text, you can import the data into Agenda using a supplied utility. Some of the most powerful applications of Agenda may be accomplished through this route, and some may go beyond personal to corporate information. This is where Agenda shows it inship to other text/retrieval and text-data-base programs. One bank, for instance, feeds Agenda overy news story about countries where it has problem loans.

Agenda needs 640K RAM to run (you can just squeak by with 512K), so you can forget about teaming Agenda with a desktoporgamizer in the background unless you have an 80386-based PC on your desk in 886 operating system, with Agenda loaded as one or of the applications. Agenda does supply a utility for the separate Lona Mero to the control of the separate Lona Mero can be supported by the separate Lona Mero in the separate Lona M

Apenda's on-screen look and feel includes a moving-bar menu across the top that's similar to 1-2-3 (it's accessed by Filo rather than the Slash key) and a toggled function-key map across the bottom. Accelerator keys speed up commonly used functions. You can assign your own key sequences to macros.

Printing capabilities are rudimentary. Rather than asking you, "Boldface header line (YN)?" you have to type '\b\ at the beginning and end of the line. You're limited to 80 characters across, even if you can used compressed print.

Agenda is a best-of-times, worst-oftimes product. Its power and abilities lift Agenda apart from the pack. It has the potential to be an important tool for anyone who deals with an overload of information that arrives bits and pieces at a time. But the Agenda metaphor may not work for everyone, and Agenda's learning curve could scare off many of the casual PC-using corporate managers who might well be Agenda's bigness customers.—Bull Howard



A sk3mm, a powerful and fast text-based database, is a power user's personal information manager. As such, the \$295 program requires that you spend a good deal of time learning how to use it. But the payback for that investment of time is great because you can use ask5mm as a very sophisticated personal data-handling tool or an application development system.

ankSom is equally happy with structured and unstructured data. making it an appropriate tool for handling ecoporate as well as personal information. The program affords you total control over the type and ways to search and report from that data. While the program has neither the prest canegories and views of Lotta Agenda nor the built-in outline forman of Grand-Vew-more, for that matter, the detached years of the control of the control

EASY INSTALLATION Installing azim is loaded with features, it comes on just two 300K disks and requires only 250K of RAM and one floopy disk drive. askbarn's SETUP program is used to specify system defaults. The menu for setting system defaults. The menu for setting system defaults is deceptively simple for the level of control it gives you. Besides the usual audkon the system of the system

Once installed, askSam is run by a series of menus. You make choices either by moving the cursor and tapping the Enter key or by pressing a single letter key. Both



askSam can import ASCII text files in the form of either 20-line records or full-length documents.

context-sensitive help screens and a help menu are at your disposal. The help file is a regular editable askSam file. The manual includes nine tutorial lessons, a reference section, and an index.

STORING DATA aukSam stores information in records and documents, both of which can be kept in the same file. A record can be only 20 lines long, but a document has no size limitation. A document can also hold a number of records. You don't need to worry about record or file structure beforehand or ever, unless you want to.

There are no constraints on how you enter data; you don't even need to do it the same way in different records in the same life. You can, for example, use a unique character, such as an assertisk (*), to mark the beginning of a special field, then switch to field names followed by a left bracket (1). A tlematively, a pair of brack-tes can indicate where and how long a field has to be.

askSam also allows you to type or importer-form text. You can set up entry templates (as many as ten per file) that can be activated by function keys. To save data entry time, you can create overlays of often-used information. And you can mix structured and unstructured data in individual records.

Once data has been entered, askSam offers myriad ways to search for information. You can search for all or part of any word or combination of characters including using the DOS wildcard characters? and *. The simple function \$: lists, totals, counts, and displays the average of all numeric entries in a file that follow a dollar sign.

COMPLEX SEARCHES But don't be decived: ack&nos' apery language to tougher as you attempt more-complex searches. It's been that previous searching experience and a knowledge of Booleany operators help. For example, if the operations help. For example, if the minimization is not application of the contents from every record of display the contents from every record of large and the contents from every record of a large and the result (divided by four) of any numeric entries greater than zero, then you'll have a ball with acts/cam.

Your searches can get even more sophisticated, ask/or fets you perform context searches, which are based on relative location to other data and proximity searches, which are based on stated distance from a given element. In addition you can store queries, perform calculations, and make the program "remember" subsets of data for further manipulation.

aukSam lets you specify records as program records, differentiated by having a colon as the first character. These programs can have flow control, conditionactions, and the ability to start other programs. Since you can start askSam from a DOS batch file with specified parameters to call up specific files and records, it? specific files and records, it?



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analysis, manipulation, and reporting systems.

THE COMMON FACTOR Whether your query is simple or complex, rest assured that it will be executed quickly. In fact, speed is the only characteristic common to all of the program's query features. For example, I used the simplest query command to find all instances of the word is in the program's 332K help file, where it usually appears several times in each screen. askSam is so fast that even though I held the Spacebar down on my 8-MHz AT (you go to the next match by hitting any key but Esc), the program always staved ahead of the standard 13-character keyboard buffer. And askSam doesn't scroll; rather, it continuously rewrites the

screen askSam also has hypertext, one of the features that make the program handy as a personal information manager. As implemented by askSam, hypertext is a way to treat the words in records as menu items from which to choose files or invoke programs. Hypertext operations can be autoloaded to further control the action of pro-

Because askSam is so fast, you can lose track of what's happening in hypertext mode if you make an error. For that reason, a feature called Backtracking keeps a log of user keystrokes made in hypertext mode to help with problem solving.

A GOOD REPORT askSam's reporting capabilities are impressive. They allow you to create labels and reports with complex format and font control. Totaling reports can have subtotals up to eight levels deen. But like those for complex searches. the commands and syntax for designing reports bring to mind a programming language, requiring you to ascend a steep learning curve.

While the current version of askSam makes it easier to control and switch among program functions than was the case with earlier generations, the program's command structure and exacting syntax may prove very challenging for novice or casual users. On the other hand, those who develop systems for others will find all the flexibility they need. If a compiler or runtime version were available. askSam could be a major application development tool as well as a very sophisticated personal information manager. askSam can tackle just about any datahandling task. The price is the time it takes to master the program.-Bruce Brown



If ever a program deserved to be called a personal information manager, DayFlo Tracker, from DayFlo Software Corp., is it. By pairing field-based forms with freeform text entry, the \$149.95 program offers a blend of structure and flexibility that is hard to beat. Whether you want to build an annotated mailing list, maintain a database of correspondence, or keep notes on phone conversations, DayFlo Tracker can do the job.

DayFlo Tracker consists of the program itself, a version of SmartKey (a keyboard macro program) that will work only with Tracker, and an application pack. As shipped, the package includes two prede-





DayFlo Tracker. Version I.1 DayFlo Software Corp. 17701 Mitchell Ave. North

Coliff

List Price: \$149.95 Requires: 384K RAM, hard disk, DOS 2.0 or later. A second version, Trucker-720, requires 512K RAM and dual 720K floopy disk drives

In Short: Its ability to use field-based forms to add structure to free-form text entry enables DayFlo Tracker to masquerade as a flat-file manager. It can use different forms in the same file, and, with 32,000 characters per record and 65,000 records per database, it's hard to outrun. Not copy protected. CIRCLE 675 ON READER SERVI

fined SmartKey macros-for time and date. Either of these can enter the appropriate value into a record with a single keystroke. DayFlo does not include a Smart-Key manual with the package but will supply one for a \$10 handling fee. Although Tracker requires only 384K RAM. it needs about 1MB of disk space and at least 100K for your data files. (DayFlo also sells a laptop version-Tracker-720-intended for computers with two 720K disks drives.)

FIRST IMPRESSIONS At first glance. Tracker behaves like a garden-variety, flat-file manager. The program lets you create fields and designate them as alphanumeric, numeric, date, or yes/no; choose fields to index; and retrieve records based on field content.

But once you get past this bare-bones description, Tracker sets its own rules. To begin with, fields have no predefined length. You can type text in any field up to the maximum allowable by the program-32,000 characters per record. You can even type text in nontext fields. Tracker will been and ask for confirmation before accepting the text, but the program will not stop you from entering it.

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Personal Designer also incorporates an array of features designed to save you time. Like "super undo" which allows you to step back one or even several steps and change your mind. And multiple views which let you look at things from

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DayFlo Tracker's combination of fields and free-form text entry lets you create structured forms like this one. The fields can be as long as you like: records can be retrieved based on the field contents or through a full text search.

Tracker can handle multiple values in each field. For example, you can enter as many keys in a keyword field as you like. The individual values are separated by a special end-of-value marker.

BEYOND FLAT FILES Surely the most interesting feature of Tracker-and the one that takes it beyond flat-file database management-is its ability to mix data forms in a file. This gives Tracker some of the features of a multifile database management system.

For example, to construct a database of sales leads in a flat-file manager, you would have to create one large form with fields for name, address, phone number, product category, credit rating, income level, referred by, and so on. If you were using a multifile DBMS, you might break this information into three files-one for name and address, one for product category, and one for credit rating. Records in the three files would be tied together by a shared field, such as referred by. With Tracker, you can do the same thing by creating three forms that share at least one field.

So if you can achieve the same results using a multifile DBMS as you can with Tracker, why not go with the DBMS? Simple. Tracker's ability to handle text gives you the freedom to write extensive notes about, say, each of your sales leads, making it more a notebooklike tool than a repository for unannotated information.

store memos, letters, random notes, items for a to-do list, notes for tracking projects. and more. If you include a few well-considered fields on all forms-such as action date, project, and keyword-you can then retrieve records in ways that cut across data-form type, such as all actions to be taken today or all phone conversations, let-

DayFlo Tracker has lots of features hidden in its menus. including a DOS gateway, a columnar report feature, and a mail-merge function.

ters, memos, and status notes related to a given project. The maximum capacity of 65,000 records goes well beyond any likely need.

A FAMILIAR INTERFACE Tracker takes its marching orders primarily through Lotus-like menus. These let you either "point and shoot" or type a highlighted character. Even building a search phrase is fully menu driven, with the program prompting you for each step of Boolean logic and optionally supplying lists of fields and stored values for each chosen Tracker's multiform feature lets you field. Function keys supplement the menu

commands. These are not normally displayed on-screen, but they are available on a keyboard template and are listed in an online help screen.

Also noteworthy is the range of search criteria permitted in Tracker. For any given field, you can search for records that are equal to, not equal to, greater than, or less than specified values: records that are within or outside a range of values; or records that contain or lack a specified string or pattern. You can even select records that include or lack specific fields. Each search can contain up to ten criteria, which should he sufficient for most users

Tracker comes with 15 predefined data forms and 17 report forms for such common needs as memos, letters, and phone notes. The application pack adds 11 more data forms and 29 more report forms, along with SmartKey-based macro menus. The four sets of menus and macros supply off-the-shelf answers for managing contact notes, projects, article abstracts, and DOS files. Even if these don't meet your needs, they can serve as a model or starting point for your own application.

MINOR FLAWS Tracker's flaws are mostly minor. For example, the only color choice is yes or no. And like many programs. Tracker uses its own arcane jargon; storing records in a file means putting them in a metaphorical filing cabinet rather than in a file on your disk. In addition, the manual doesn't tell you how to remove Smart-Key from memory after leaving Tracker. Sorely missing is any documentation for the application pack; before you can modify the macros, you have to decode them.

One potentially serious drawback is Tracker's lack of a background mode: consequently Tracker files are not immediately available at all times. However, I found that Tracker had no problem running under DESOview or Carousel.

Very much on the plus side, DayFlo Tracker has lots of features hidden in its menus, including a DOS gateway, a columnar report feature, and a mail-merge function, among others. Best of all, the features hang together in a coherent package that is easy to learn and fun to explore. The more you use Tracker, the more you'll like it. This is one program that's earned a place on my hard disk .- M. David Stone



D ragnet, a \$145 Microsoft Windows-based program from Access Softek, is billed as text-management software, a designation that begs for further explanation. Similar in many ways to traditional text-retrieval programs such as ZyIndex, Dragnet will search through any ASCII file looking for a keyword or phrase. But the operative word here is similar. The differences are significant.

By getting rid of indexes, Dragnet eliminates the indexing chores common to most text-retiveal programs. To look for information, you tell the program which files to search and what to search for. Dragnet looks in the original files.

You pay a price for the lack of an index. For example, if you've archived files on floppy disks, you'll want the ability to search for a match and be told which disks to put in your computer. Dragnet can't do that because it can search only files that are already available to the computer.

Although eliminating the index also results in slower search speeds, this doesn't tell the whole story. Indexing and reindexting large files can take considerable amounts of time. If you're searching through files that are modified oftensuch as research notes for a current project—Dragnet will often be faster than programs that rely on indexes.

Dragner is also a good choice for a onetime-only search. Consider this application: suppose you've written a novel and want to eliminate one of the characters. Dragner will find all references to that character, and it won't waste time intering files that you are planning to revise. More important, for each search Dragner produces a "results" file that shows the filename, page, and line number for each match. The matches themselves are shown



in context—by line, sentence, paragraph, or user-defined section.

SEE WINDOWS RUN Dragnet comes with a runtime version of Windows 1.0 and two versions of the Dragnet program-one for Windows 1.x, the other for Windows 2.x. (Version 2 of Dragnet, which will run under only Windows 2.x. should be available by the time this issue hits the newsstands. The vendor plans to sell both versions of the program.) To install the runtime version of Windows, you put the setup disk in your drive, type setup. and follow the instructions on screen. If you're already a Windows user, just create a Dragnet directory and copy the appropriate version of the program to that directory. The program's command strategy includes pull-down menus, pop-up dialog boxes, and shortcut commands, many of which are arbitrary (for example, 'R for continuous search, 'X for interactive search).

Dragnet's ability to run searches in background mode is a useful Windows-based feature (though not available in the mintime version of Windows). With the Windows Lx version of the program, you can run up to three searches. A fourth Dragnet window usually crashes the system-However, this sid not occur when I tested the Windows 2.x version using four windows.

The program also has a foreground search mode and an interactive mode.
With interactive mode, Dragnet shows

Dragnet's "result file" shows the results of a search for references to IBM in the file PCMAGAUG.TXT. In this example, matches are shown in

the jue
PCMAGAUG.TXT.
In this example,
matches are shown in
the context of a single
line; other context
choices are sentence,
paragraph, or custom
defined. Note the file
reference before the
list of matches.

you matches as it finds them and lets you decide whether to use each one. You can also modify the amount of text that goes into the result file and can type an additional note.

As you would expect, Dragnet lets you define a search by typing both a search phrase and the names of the files to search. Search phrases use standard Boolean logic: they link words together with AND, OR, and NOT and designate priorities with parentheses. The search phrases can also use special wildcard characters for matching numbers, letters, and other specific characters.



In Short: A Windows-based text-retrieval program, Dragnes is capable of searching the full text of files, making it relatively slow for repeated searches of the same files. Where files are revised regularly, Dragnes's full text search is faster and more convenient than reindexing the file. Not copy protected. CPCLE PROPRESESSING LOPIO

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■ PERSONAL INFORMATION MANAGERS

BUILDING LIBRARIES Dragner's most interesting feature is its ability to create libraries of keywords, search phrases, and file groupings. The keyword library lets you enter the words you search for regularly and create a list of synonyms for each word. Synonyms for the word camera, for example, could include Brownie.

Dragnet has a foreground search mode and an interactive mode. With interactive mode, Dragnet shows you matches as it finds them and lets you decide whether to use each one.

Polaroid, and SLR. You can then use the pattern library to create search phrases, linking synonyms together with OR, so that the search phrase CameraSyn might be "camera OR Brownie OR Polaroid OR SLR".

Having created the phrase CameraSyn, you can call on all the synonyms for camera in a single stroke. Similarly, Dragner lets you group files together and give them aname. Once you have libraries of phrases and file groupings, you can describe a search by picking the appropriate phrases and file groups from a list. A single search brises can be used 510 characters lone.

Through the use of phrase libraries, Dragnet comes into its own as a personal information manager. After writing notes in your favorite text editor, including such information as date, type of action, and project name, you can then exploit predefined search phrases and file groups in Dragnet to create lists of all phone calls or meetings on a given date, or all notes about a given project.

SLIGHT IMPERFECTIONS Alas, Dragnet has a few minor shortcomings that mar an otherwise excellent program. For example, once you've entered a name in the library, you can't change it. Instead, you must delete the old name and create a new entry from scratch. A more important limitation is that the program will retrieve only 510 characters in the result file for each match. If you need more than that, you will have to go back to the original file to read it.

Dragnet is tailor-made for searching through files that are open to revision. If you want a text-retrieval program that skips the indexing step, be sure to look at Dragnet.—M. David Stone



M isrobytics, the company that brought by you Word Finder, has gone to great lengths (even to the very boundaries) or good taste) to make GOPer, its \$79 volume to great testing at the light peached in the peace of the company of the light peached manual sports againing, its-clad, sneaker-short mother to the cover and insists on personifying the program throughout. It might all be too person the course of the course of

easy to use, and easy to customize.

GO/pr's mission in life is to find text on mass storage devices. Given a search criterion and a set of directories or files to examine, it takes off in search of missing words and numbers. Each time it finds what it's looking for, it pauses to display the filespoe, the sought-after text, and foll lines of surrounding material. Having viewed the results, you can export some or placiation, print it, or pipe it into a new disk file. Or you can send GO/pr back to disk to file the print is for the control of the control of the file. Or you can send GO/pr back to disk to

Alternatively, you can ask GOfer merely to present a summary list of all the files in which your search text can be found. Unfortunately the program doesn't offer a convenient way to print this filespec sum-

GOJer runs in both resident and nonresident modes—your choice. The TSR mode is extravagant—it chews up anywhere from 94K to 166.5K of precious conventional memory, depending on how fast you want it to work—but it lets you find the information you need directly, without leaving your work context. By default, GOJer uses 112.5K; a simple setup program allows you to increase or reduce its memory appetite.

SIMPLE OR COMPLEX A GOfer search spec can be simple or moderately complex. The "entertext to go for" screen presents two groups of four fields, each of which can hold up to 20 characters. The



Besides doing data searches, GOfer can more files: any amount of text in the "hit" file can be marked for copying into another application.



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But as the leading software developer for personal computers (and one of the first to bring a graphical interface to PC screens), we've gone a step further. Microsoft Windows/286 with PC Paintbrush for

licrosoft Windows/286 with PC Paintbrush* for Windows, Microsoft Paintbrush or EasyCAD**2 actually come with the Mouse (or vice versa).

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fields of each group are joined by OR operators; the groups are joined by AND, NOT, OR, or NEARBY. The NEARBY operator means anything from 1 to 99

lines, depending on how you define it. By default, seashes are carried out in "uppercues and/or lowercase" mode, but you can change that to other "just the way it appears." The last of these is handy when you don't termenibet how a proper name is premared. The last of these is handy when you don't termenibet how a proper name is produces a search to fuzzy to be useful. Offer appears to pick up any words that have at least two letters in common with the criterion, a fuzzy search for woman, for example, turns up company, more, and Compana, as well as women. A true wide-cause is the company, more, and company, and company are contained to the acceptance of the company more and company, as well as women. A true wide-cause is the contained that the contained the acceptance of the contained that the contained the and contained the acceptance of the contained that the contained tha

tion to GOfer's search-spec repertoire. GOfer directly supports 30 applications, including such favorites as dBASE III. DisplayWrite (3 and 4), Lotus 1-2-3. Microsoft Word, MultiMate, SideKick, Volkswriter, WordPerfect, and XvWrite III. as well as a few relatively obscure ones. The configuration program lets you pick up to ten of these programs to have "on board" as you work in GOfer. Then, before you execute a search, you can select the most likely "read from" and the current "write to" program. Choosing the correct "read from" program isn't strictly necessary, but it helps GOfer format the text on-screen when it finds it. Choosing the proper "write to" program lets GOfer transfer data correctly into your current ap-

pilication.
If the program you use isn't on GOfer's list of 30, you can fill in the blanks for up there "available" islos. Doing this is a bit like making a program information file for Microsoft Windows or DESOylew. It requires answering a dozen or so questions about whether your program usually operates in insert or overstrike mode, how GOfer can tell which mode it's in, what filename extension it typically uses, and so on. Reasonably wonGenerates with the contraction of the grant of the contraction of the contraction

BEYOND SEARCHING GOfer has a few other virtues besides its searching capability. It includes a brows mode that simply lets you select a file and read it without leaving your spreadsheet or word processor. And it offers rudimentary DOS file management functions—copy, delete, and remarks

the task quite manageable.

More important, the program can assist in the archive-trieval process by compressing and decompressing files, Microphics says in compression utility will reduce the size of files by up to 50 percent; I compressed about 500 text files and averaged 41 percent. Other utilities can do better than that, but GG/pr can read its own squeezed files without unsqueezing them first.

So what's missing? Primarily, the ability to index files for faster searching. Users with truly massive data-retrieval needs might save time in the long run by choosing a program that can create a separate index file, even though indexing itself is invariably a time-consuming process.

How quickly GOJer works depends, of course, on your hardware and the complexity of your search criteria. I asked it to find all references to Quattro in a book stored in 6.7MB of data on my PS/2 Model 80's ESDI disk; it turned up 8.672 hits in just under 4 minutes—fast enough for my needs but possibly not for yours.

GO/er cannot predefine file sets for searching. You can select particular files within a directory, or particular directories (with or without their subdirectories), but searching something more arbitrary—such as a set of sibling directories or a group of files on more than one drive—requires repeated use of the "yeo for it" command. In short, GOfer is a straightforward search utility that's well suited for ad hoc use on a small to medium scale by users with average computer skills.

—Craig Stinson



If you like organizing your thoughts in outline form, you'll love Symantec Corp.'s GrandView. If you've never used a PC-based outliner, you should check out

this \$295 program; it's one of the best. Producing outlines is Grand/tiev's reason for being, but that's not all the program can do. Features such as categories, macros, advanced text-handling and formatting, sensible but flexible printer control, and a Microptic's spelling checker make Grand/tiev one of the top personal information managers as well.

BACK TO BASICS If you've used Symante's Think Than or Ready!, commance's Think Than or Ready!, commance's Think Than of Ready!, commance's Think Than of six tutorial storics included in a 250-page user manual cover most program functions, illustrating them wost program functions, illustrating them with realistic sample files. The program also comes with a 300-page reference guide, a 4-page Quick Start guide, and extended that the program of the program

GrandView's help screens won't appeal to minimalists: they're chock-full of peal to minimalists: they're chock-full of sections, menus, and prompts and look about as busy as room full of 3-year-olds. But if you have an aversion to manuals, but if you have an aversion to manuals, but if you'll get along fine just by following the help screens. The program displays bori-contal-bur memus for major command sections; more options reside in pull-down memus and pop-up windows.

Besides these menus and windows,

CompuServe is offer on these

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Importing files in GrandView is accomplished through simple popup windows. Several source-file formats are supported.

GrandView offers several—maybe too many—ways to choose and execute commands. You can select menu commands with cursor keys or a mouse, use single-teter commands, or use function keys and keystroke combinations. In offering all these choices, GrandView's designers clearly tried to suit the different styles of the broadest range of users.

Since outlines are held in memory while you're working with them, they can be only as large as the conventional memory available on your computer. An austine entry, called a headline, can be up to 64K in size. You can attach any type of lest to a headline in a form called a document, which is also limited to 64K. You can use documents to add free-form information about a headline or even to contain indexes, memors, and other word processing functions.

POSITIONING HEADLINES It's easy to position headlines using the cursor and control keys. Whether you move a head-line higher or lower or make it dominant or subordinate to the headline preceding it, GrandView automatically renumbers the outline.

GrandView expands or collapses headlines at your command, in effect letting you zoom in or out of specific parts of the outline. The program uses a clipboard to move text around an outline; you can also copy or move headlines from one section to another. A headline-cloning feature lets You keen the same information in several places within an outline without having to worry about updating each occurrence: when you change one clone, the rest change too.

GrandView uses categories to filter or shuffle headines, allowing you to look at them in different ways. For example, a todo list might have categories for Type of Activity, Who Else Is Involved, and Supplies Needed. Date and priority categories are included with all outlines, but you can add whatever other categories you wish, such as Person Responsible, Type of Business, or Contact, as long as you don't excert 20 in all

Also important is the concept of assignments, or short definitions that summarize the content of important headlines. After you set up categories for your outline, you must assign these definitions to one or more categories. You can then view your outline by assignments.

You have the choice of typing each cuacopy assignment or letting GrandView do it for you by matching your keystrokes, with existing entries. Or you can set up automatic category assignments (for instance, assigning Bob to the Person category for every headline that contains the word training). I found this last feature easier to use than a similar one in Agenda, but not as robust.

move text around an outline; you can also
copy or move headlines from one section
to another. A headline-cloning feature lets
you keep the same information in several
use most often, since it lets you look at



headlines from many different perspectives. In Category View, the top-left corner of the screen shows the categories you've set up for an outline, and the top night shows the assignments you've made for a category that you've highlighted. The lower part of the screen shows the headlines that match the category and assignment combination displayed in the top two

To be sure, that's not GrandView's only impressive feature. The program lets you open up to nine outlines at a time. If you want multiple outlines to appear onscreen at the same time, you can view them as tiles or in folders or have them overlap—enough choices to satisfy most anyone.

You can time and date-stamp headlines, create templates, and name headlines for reference when copying or moving them (which resembles naming a spreadsheet range). Headline-labeling styles casis for numbers, letters, symbols, bullets, and connecting lines. In addition, you can use the program's marco language with learn mode to create, save, and play you can reconfigure the keyboard to sait your preferences, changing command-key assistences.





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CORRECTING MISTAKES If you mistakenly delete information, you can use GrandView's undo command to restore that change. While GrandView's undo command lets you rescind only the last deletion, it has the unusual ability to remember the last deletion even if you've exited the program and turned off your computer. To prevent against more-serious data losses, GrandView has an auto-save feature and will also let you save backup copies of files if you desire.

GrandView's printing facility is one of the program's strongest features. Pop-up windows offer many convenient printing controls, including font and style choices for all or some outline levels, or even for selected text. You can print by categories or assignments and can create custom printing formats for blocks of text as small

as the paragraph.

Despite all these powerful features, GrandView's way of looking at the world isn't for everyone. But it's the personal information manager of choice for people with an unwavering devotion to the outline method.—Bruce Brown

Guide

Owl International's Guide, originally released in September 1986, was the first commercially available hypertext system for PCs. Although, like other hypertext products, the \$275 program lacks many of the features common to personal information managers, it earns a place in this product category for the power it gives you to organize information.

Guide hypertexts, even complex ones, maintain the appearance of word processing documents. Your only clue to their special nature is their use of text styles (bold, underline, and italic) to show the hypertext links, Guide's word-processor13 (3)

Tires, 180 polithen the PS-2 line, adds makel 70, and enhances madel 50. (First Leeks) (PC Messaine: for 1986)

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mery: IBM does not regan its position as technology leader with its new additions to its PS-2 line, Compaq with its Deskpro 395 of Sept 1986 has claimed that. But the company has filled gaps in the PS-2 line an enhanced Model 50 - the 50Z - that has faster RAM zero wat state, and more responsive and larger hard disk, a series of Model 70s. that are 385-based units housed in Model 50 sized cases. The three 70s offer 16, 20, and 25-MHz respectively with the latter having a 64K memory cache and Irrei 8235 cache controller to further speed performance IBM also is adding a \$2,395 scanner with 300 dot-per-non resolution. Selected price cuts will occur to existing computers in the PS-2 line , clos here for full fest

like feel is both its greatest strength and its greatest limitation.

HYPERTEXT AT WORK Here is one example of how Guide works. Suppose you're scanning a list containing the titles and authors of computer articles and you see one that interests you. Using a mouse, you click on the word Summary, which expands that citation into a summary of the article and moves the other listings down. You then click on the word title, popping up a window with the source of the text. When you release the mouse button, the pop-up window vanishes. At the end of the summary, another button takes you to a file containing the article's full text. Guide's big shortcoming in managing this type of data is the lack of batch processing to create the buttons and links. Each one

must be created by hand. Here's another example. You're looking at a textbook on-disk, with links between common topics and ideas scattered throughout. While reading a passage, you see a subject that you want to pursue. You click on the word and find yourself almost immediately somewhere else, looking at related work. From there you follow a similar link to another subject. To return to where you were, a simple click on the Backtrack icon steps you back through the

Herein lies one of the most severe limitations of hypertext in its pure form. A hypertext document is only as good as its links. If the links are few or poorly Moving, cutting, copying, and pasti text are as easy to accomplish in Guide as they are in any Windows

Although, like other hypertext products, the program lacks many of the features common to other PIMs, it earns a place in this product category for its ability to organize information.

planned, the result may be little better than that achieved by a word processor with searching abilities.

BUTTON TYPES Guide is based on the word link. In Guide, the button consists of a word or a phase. If you edit text and you cause the location of the word to change.

the link moves with it.

al port.

The program has four main button types. Text style is your main clue as to which text is a button and which type of button it is. The cursor furnishes additional reinforcement by changing into an icon that represents the button type when it passes over the text. Reference buttons-a classic hypertext link-jump you to a new place in the same document or to another document. Replacement buttons expand to show additional text or to replace the button with different text. When used to add detail, they resemble an outliner that allows expansion of individual points. Note buttons pop up a window of several sentences in the upper-right-hand corner of the screen. They are good for help text or minor supporting information, such as the source of the text. Command buttons launch other applications or talk to the seri-

In contrast to the discrete blocks of text and graphics found in HyperCard, the popular hypertext program for the Apple Macintosh, Guide uses "parallel strips of writing." Because of Guide's ability to show multiple linked files on-screen simultaneously, you can build a screen of

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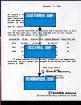
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Owl International Inc. 14218 NE 21st St. Bellevae, WA 98007 (800) 34-HYPER (outside Wesh.) (206) 747-3203 List Price: \$275 Requires: 640K RAM, hard disk, mouse,

DOS 3.1 or later. EGA card strongly recommended. In Short: While it lacks many of the features found in other PIMs, Guide's hypertext abilities suit some tasks, such as creating interactive documents like textbooks and manuals, very well. Not copy protected.

text comprising several interlinked files that flow together into a single nonsequential document.

Guide's ability to import graphics into documents sets it apart from many other personal information managers. These graphics can also be buttons. This allows you to include in your document technical drawings or business charts with links to explanations or follow-up information.

AS EASY AS WINDOWS Owl International offers Microsoft Windows and Macintosh versions of Guide. Both behave similarly. As of this writing, file compatibility is unavailable. (Owl says that it is working on a conversion program.)

Moving, cutting, copying, and pasting text are as easy to accomplish as they are in any Windows application. Guide also offers standard string searching for situations where a link has not been created. The search can include or exclude text hidden under buttons but cannot find linked text in other files.

You can change text styles and fonts, except for those that the program has already designated as button types. But, since changes can affect entire sections of text, you can trick Guide into changing single words or phrases—or leaving them unchanged—by turning them into buttons first. Owl International's refutence to encourage the use of this ability is likely due to the confusion it could create. If text style

is your main visual clue to button type and location, then using bold, italic, and underline for other reasons is probably ill-advised.

Although Guide has nothing comparable to HyperCard's powerful HyperTalk programming language, it does offer some programming capabilities beyond text links: Guide's Command-button scripts let you launch other applications if you're running under a standalone version of Win-

dows." Still, the Command-button scripts that let you run other programs from within Guide don't have the versatility or power of a feature-rich programming language like HyperTalk or the extensive macro language of Agenda. As for organizing all those little notes and random documents that accumulate on your desk—or for managing projects and people—look to personal information managers that specialize

in handing those tasks.

Nonetheless, in hypertext operations,
Guide excels. It is easy to use and powerful
enough for business applications.
Al-though the lack of a way to organize textual
infus automatically makes calactically makes calactically
large amounts of data a tedious process,
the results may be worth the effort. For
creating interactive documents, such as
extendors and manuals, Guide does not
cellent job and should be strongly considend—Philip F. H. Rose



Experience In Software was founded with a single goal in mind: to come up with software adaptations of techniques presented in Gerard I. Nierenberg's popular self-help books on negotiating and problem solving. The Idea Generator, the company's second product, is inspired by the book The Art of Creative Thinking.





The Idea Generator, Version 1.1 Experience In Software Inc. 2039 Shattack Ave. Berkeley, CA 94704 (800) 678-7008 (415) 644-0694

List Price: \$195 Requires: 256K RAM, two disk drives (hard disk recommended), DOS 2.0 or later. In Short: Designed to help users come up

with problem-solving ideas, The Idea Generator is based on an interesting concept but suffers from limited text-organizing facilities. Not copy protected.

which is included with the \$195 package. As its name implies, The Idea Generator is designed as a catalyst for producing ideas on how a specified problem could solved. It works primarily by helping you cast the problem in different lights in a reffor to get the creative juices flowing. It really has no application beyond this quite limited purpose.

DEFINIG THE PROBLEM Using the program couldn't be simpler. It guides you through each step of its problem-solving process with detailed prompts, explaintons, and advice. First, you're required to define the problem and list the goals you wish to accomplish. You're asked to rate the importance of each goal, and the program then reorders the list to reflect this. You must also list all the people involved in the situation.

in the situation. In the second stage—the real meat of the program—you generately part ideas for the program—you generately your ideas for the program—you generately your ideas select any or all of seven methods you want to use to give your creativity a swift kick in the pears. These include the following: Think of metaphors for your situation ing. Think of metaphors and play approaches to the metaphorical situation in your own problem. Think of ideas that might spring from the other people involved in the problem or from the "violect" in your lead (reality, from the "violect").

```
see what ups can do with the ideas that seem jourt months!
 MTICH: I want better performance than my XT can give me
          Pick your jourt useful ideas from the list
     include any was feel are inspelicable, indepente or ridioxiden
```

In the ideaon stage, The Idea Generator gives you a chance to discard ideas you feel won't be useful and to expand others.

opposites of your goals, think of how you might achieve these reversed goals, and then consider the opposites of these approaches.

The point is to jot down as many ideas as you can, no matter how silly they seem. You're then given the opportunity to hone each idea or to discard it altogether. If ideas pop into your head that have no relation to the part of the process you happen to be in at the time, you can save them by activating the pop-up Idea Screen to jot them down. These random ideas will then be added to your collection without interrupting the sequence of the program.

MAKE IT BRIEF One limitation of the program becomes immediately apparent at this stage. Your ideas are restricted in length to 54 characters each. While this does force you to be concise. I found myself squandering time trying to devise abbreviations that would let a longer idea fit in the space available.

The final stage of the process lets you evaluate the relative merits of the ideas you've come up with so you can pick out the best ones. First, you rate the quality of each idea on a scale of 1 to 9, and The Idea Generator reorders them accordingly. You can then highlight any ideas you wish to evaluate further. The next step is to use the same scale to rate how well each idea meets each of your goals. The program then takes this information plus the weight you gave each goal and generates a single rating for each idea. Since the ratings ac-

cording to goals appear in a column next to your ratines according to overall quality, any significant discrepancies between the two will catch your eye. A nice addition to this phase of the process would be another reordering of the ideas based on the combination of these two ratines.

COSTS AND BENEFITS Another evaluation option lets you list the costs and benefits of each idea you've rated. Unfortunately, Experience In Software misses a bet by not ranking your ideas according to their cost/benefit ratio. It could even let you assign different weights to each pro and con. This option would also let you list the effects of each idea on all the people involved, but again the program makes no analytical use of this information.

When you finish each stage of problem solving, you have the option of generating a summary report of all the goals, ideas, and ratings you've entered at each point in the process. You can display the report onscreen, write it to disk, print it, or export it in ThinkTank format. (Conversion to Agenda format should also be available by the time you read this.) In addition, you can save entire problem-solving sessions under different names and then call them up later to finish them or to redo any part of the process.

One of The Idea Generator's liabilities is that it doesn't let you generate subsidiary ideas under a main idea-a significant weakness since this is an important part of

find yourself with a number of related ideas, you can't group them together and treat them as a unit. One option in the ideagenerating stage lets you regroup related ideas together in your list, but this is generally a temporary procedure and is done mainly to help you spawn more ideas in the same vein

At first glance The Idea Generator may seem like merely a flaky outgrowth of the self-help boom. Upon closer inspection, though, it turns out to be an interesting distillation of some useful problem-solving approaches. For some it may well prove to be just the thing to get those ideas flowing. However, the product's strength lies in the intellectual concepts underlying it rather than its information-handling capabilities. Until the package delivers more of the functionality that people turn to computers for-such as better facilities for organizing ideas and more analytical functions to evaluate them-there's the danger that people will use it a few times, absorb the concepts behind it, and then abandon it in favor of a more flexible product to handle the real day-to-day work.

-Robert Kendall



By offering formal and informal data formats along with outlining, a monthly calendar, a daily scheduler, and six interrelated windows. Valor Software Corp.'s Info-XL gives you a multifaceted view of information. The \$295 program lets you search through several of these windows at once and cross-reference data. tying together different kinds of information in every way that counts.

Info-XL's main organizing window is called Manager. It might just as well have been called Skeleton, because it holds your the creative process. Conversely, if you information in outline form Every entry is

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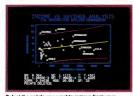
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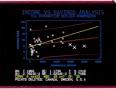
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Info-XL uses six windows to display related pieces of information. In the default arrangement thown here, to a structured outline of the information that is dynamically linked to the structured data in the Records window and the free-form text information in the Comments

considered a heading; each can be indented to create sublevels as deep as you want. Levels can be collapsed or expanded to control the amount of detail you see.

SIX WINDOWS For every entry in the Manager window, you can have a Record and a Comment, each in its own window. The Records window is database-like, requiring that you enter information in fields. Info-XL offers you five record types, but you can add or delete fields in these records or create as many new record types as you like.

The Comments window is where you canter free-form information up to 10K in length. It's here that you also find such basic word-processing functions as find and replace. You might want to use it for entering notes about people or companies, a history of telephone conversations, meeting minutes, research memoranda, reminders, article summaries. Text entered in the Comments window can also be cut and posted into the Records window.

pasted into the Records window.

In this initial version of the program, the Comments window is also the place where you import ASCII, WordSur, and other word processor files. The importing feature is somewhat crude, requiring you to do a lot of cutting and pasting as well as keying headings into the Manager window. But you can record a keybeard macro but the properties of the properties

According to Valor Software, the program's importing facilities will be imrepaired by the property of the proting of the first quarter of 1898. The revision will allow you to send data directly into the Manager and Records windows, and will also let you import comma-delimted ASCII and dBASE files. Version 1.1 will have on-line help, new documentation, and a phone dialer.

A Daily Schedule window shows you the headings you have dated and timestamped in the Manager window. You also get to see the higher-level heading under which an entry falls. A speed-key combination of Cut-G lets you jump from a high-lighted item directly to the corresponding heading in the Manager window.

The Monthly Calendar window, which is linked directly to the Daily Schedule window, presents a month's worth of information and highlights dates to which earthvites have been assigned. Placing the cursor on a day with activities display them in the Daily Schedule window here in the Daily Schedule window Monthly Calendar windows makes it easier for you do such things as plan and review projects and maintain to-60 lists.

TIGHT INTEGRATION Because different pieces of related information are linked through Manager headings, they become visible at once. An event heading located in Manager could be linked to relevant information in Records, Comments, and Daily Schedule windows.

Besides showing information that is directly related, Info-XL lets you move quickly to more distantly connected data by scrolling to different levels of headings in the Manager window. For example, you might go from the listing of a customer to the listing of a competitor, and then to a particular product of that competitor-with a list of product specifications in Records and several competitive sales approaches in Comments. Best of all, you never have to open and close different database files to do all this. You can even connect sections of the Manager by putting the same heading in a number of places and marking them as linked. Then you can

jump from one linked entry to the next. Info-XLY is canch window holds the results of a search performed on Manager. Records, or Comments windows individually or in consort, letting you bring to-You perform a search by specifying a lext string; the degree of proximity, which is the relative exactness of the search match, the windows to search; and its scope. Excust properly, a search will yield the appropriate Manager beadings with their pardirectly from a search hit to the heading in

Manager by using the Ctrl-G speed key. Unfortunately, the program doesn't let you perform true multiple searches or use Boolean connectors. But you can combine



the results of several specific searches, thereby closely approximating multiple. AND searches. Or you can type different topics into the search string and, by choosing a loose degree of proximity, hope to net topics that might be found by traditional OR searches. However, these loose searches are bound to bring in information that is far from the mark.

Info-XL comes with five preset window configurations. The default configurations shows five windows at once: Manager, Records, Comments, Daily Schedule, and Monthly Calendar. The other configurations group the windows together differ-

ently and size them appropriately.

The program actually lets you create as many screen configurations as you like by moving, sizing, and hiding windows, af-

fording you great viewing flexibility. Info-XL's main weaknesses are its somewhat limited search capabilities and its inability to import dBASE and commadelimited ASCII files. Its main strength is its suitability to an almost endless variety of applications. Easy to use and tightly integrated, Info-XL shows a lot of promise.—Henry Fersko-Weiss



ZE (pronounced "eyes") from Persoft is nothing if not ambitious. A hybrid of features culled from text-retrieval programs, outline processors, and hypertext,

the \$445 program proves a new breed of software can offer solutions to an old problem: how to organize documents you create with various application programs into

one coherent retrieval system. IZE can index and retrieve files that reside in the native format of any number of other application programs. IZE manages this by dynamic linking to the executable application program and automatically invoking it to give you useful access to a document that it has retrieved. You don't lose access to your favorite word processor or spreadsheet program because IZE contains drivers that can dynamically link to 39 other application programs, including Lotus 1-2-3, WordPerfect, ThinkTank, O&A. Microsoft Word, and Quattro. Alternatively. IZE can store entire documents of up to 32K in length in an internal textbase. Each textbase in turn can store up to

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The IZE textbase is related to a database

How the competition stands

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only in the sense that you cannot access the individual files from DOS. However, unlike a database's structured fields, each IZE document looks and behaves like a standard word-processing file.

You can create documents by using the

IZE organizes documents you create with various

programs into a single coherent retrieval system.

IZE text editor, importing ASCII files, or translating files from the 20 word processors supported. You operate the simple text editor with either a well-organized menu or mnemonic control-key commands. Be warned: I found IZE's internal text editor to be ill suited for creating long documents. IZE is no substitute for your favorite word processor.

The worst thing that I can say about the IZE dynamic linking is that it is a bastardized version of hypertext-and as a result. it can be awkward to use. The best thing that I can say about it is that it really works. At installation, you must install the drivers for the programs you may want to execute from within IZE. From that moment on, files created with that application are available to you by choosing the dynamic-link import function from the File menu.

When you dynamic-link-import a file, you don't really import it. Instead IZE creates a little internal textbase file that contains a pointer icon. Simply place your cursor on the diamond-shaped icon and hit Enter. IZE will then make a backup of itself to disk (about 500K), reserve a 30K kemel of memory, invoke the appropriate



application program, and call up the correct file

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The 30K kernel that IZE reserves in

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IZE's drop-down menus make the transition from novice to expert user easy by listing both the single keystroke that will invoke a command from the menu and the alternative Ctrl-key combinations

memory allows you to pop up a window where you can append keywords to the file. Other than that, you are truly in the application of your choice and can make changes to a file. This is ideal for anyone who needs to index a large number of files but also meeds to constantly update those files. ZE ensures that the file you retrieve files. ZE ensures that the file you retrieve one copy of that file exists owned to.

The pointer file functions as a normal IZE document in all other respects. You can enter lengthy and detailed descriptions of the file to which it points. These descriptions come in handy because you must exit the application program conventionally in order to do another search. IZE does wait in memory to leap back to your screen when you leave the other application, but in general the process is clumsy and a waste of time if you are doing multiple searches. By allowing you to add descriptions to the pointer file, IZE hopes that you will be able to search many pointer files and path out to an application program only for a hit.

DIAMONDS AND TRIANGLES IZE also contains a second, more elegant implementation of dynamic linking. Small triangular icons (a variation of the diamond mentioned above) can directly link IZE text files to one another. Place your cursor on an icon, hit Enter, and you are whisked to its companion icon in another

file. Files can contain many pointer icons; these icons can be positioned anywhere in the file, and they indicate the direction of the link. Shaped like arrowheads, the first triangle points forward to the right, and its link points backward to the left.

You begin to create a link by choosing the function from the menu. IZE allows you to search for the file you wish to link to with all of the standard search functions. When you find the right file, you invoke the menu again and choose the Finish Link option.

Once files are created, imported, or linked, you must designate the keywords that IZE will use when retrieving the files. The function keys are reserved for file and search operations; F4, for example, highlights keywords. After going through a 20minute tutorial, I found using the function keys preferable to executing the same commands from the menu.

commans from the menu.

Hitting P9 stars the search process.

You fill in an entry form with either a single keyword or a complex Boolean statement. IZE allows you to use all the statement. IZE allows you to use all the standard AND, OR, and NOT combinations, as well as fuzzy searches on keywords, as well as fuzzy searches on keywords, as well as fuzzy searches on keywords, as well as fuzzy searche parameters gives you the power to weave your retrieval net as fine or as course as well with the process of the power to weave your retrieval net as fine or as course as well with the process of the proce

Unlike other text-retrieval products, IZE conserves disk space by using an algorithm instead of an index to perform nonkeyword searches. I was pleasantly surprised by the speed at which IZE performed nonindexed searches.

RELATED FILES IZE responds to every search request with a list of the files that match your parameters, but with a unique twist. It automatically puts the results of a search into a hierarchical outline based on the number of files that share keywords. This simple set-and-subset method generates an intelligent outline that shows files in relationship to one another.

The IZE outline speeds searches by supplying a context in which to review the results of your search request. The outline also functions . . . well . . . like an outline. You can expand it or contract it down to main section headings. More important, you can perform group functions, such as file locking or deletion, on an entire section of the outline.

CONTROL OVER KEYS The lynchpins of an accurate file-retriveal system are the keywords on which you search. IZE maintains impressive control over keywords in the form of keychangers, keyword filters, and guidelines. With them you can automate and influence assignment, searching, and outline generation.

Guidelines are the simplest tools. You use them to create a template, which IZE must then follow to generate an outline. It's a direct method of controlling the shape of the information.

Keychangers and keyword filters are more-powerful tools. When importing a group of files, you can instruct IZE to assign a keyword altomatically to all files, whether or not that word actually appears in the text. Alternatively, you can have IZE designate a certain word as a keyword whenever it is encountered. You can even all IZE has it should disappase whatever it ell IZE has it should disappase whatever it for example, importing a group of letters and designating client names a keywords requires only that you instruct the program to pick up everything between the word Dear and a comma as keyword.

Keyword filters influence searches and outlines. IZE understands equivalencies where many words can be considered as one. By using a special syntax (for example, editorial: editorial = editor = edit =

cuitor cu

The future of personal computing now rests on just one thing.

final focus that original Microsoft vision. Through Windows, any number of software applications will seamlessly integrate. Sophisticated spreadsheet pro-



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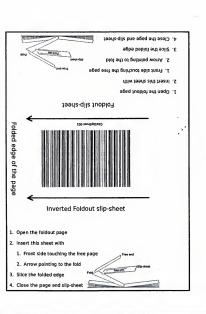
But all this doesn't end at the desktop. With Microsoft OS/2 LAN (local area network) Manager, it's as easy and natural to work on a network as it is to work alone.

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J. Follow instructions on the other side

Back

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Inverted Back

1. Follow instructions on the other side

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The world wasn't waiting. We were. The PC makes its debut.

If you happened to catch the January 1975 issue of *Popular Electronics*, you were one of the lucky few to witness the debut of the personal computer.

the personal computing samples as it seems, a magazaine with less than one-tenth the readership of *Time* or *Newsweek* launched a technology race roughly parallel to that of the space program. It also launched

a company that immediately assumed center stage in the exciting

new world of personal computing. The company was Microsoft, and the tenet upon which it was founded was a simple one. To see a computer on every desk and in every home. contraption that was the early personal computer and turn it into the powerful machine that has literally changed the way we work, required some important

order of business was to create not simply products, but standards. Microsoft* BASIC became the first universal programming language for the personal computer. And set a standard upon

which an industry could grow.
sits debut. Next came what is now the world standard PC

operating system, MS-DOS, developed by us and chosen by IBM for its first personal computers Today, 20 million machines run on it, and so does a billiondollar software industry.

being developed, we were there. That early participation allowed us to write its richest and most important software. These crucial pieces include the powerful



Microsoft Word, the muchapplauded Microsoft Excel, and Microsoft Works, the singlesolution program for the diverse needs of small business.

As we were contributing to the development of the Mac, we were also developing a system to put graphics interface technology into the world of IBM* PCs and compatibles.

The introduction of Microsoft Windows in 1985 meant that an easy-to-understand desktop graphical environment now appeared on PCs. Ultimately, this friendly screen will forever replace the cold theater of character-based computing.

But Windows is more than just a useful tool. It is an important technological feat, one that becomes critical to bringing into







emake

working with pictures makes the work you turn out much more interesting. Which is why the introduction of Microsoft Windows to the IBM PC and compatibles brought with it a whole new category of software with impressive credentials. Like

a more finished look. And no matter what application you're using. Windows will take over the iob of running

your printer. There is also

a hardware complement to graphical applications: the Microsoft Mouse. An unprecedented 1.5 mil

lion users have found that a simple point and click eliminates complicated keyboard commands

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WYSIWYG, as in What You See

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soft Excel, goes

so far beyond

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screen to even greater heights. By unlocking the capability of these machines, users can easily switch between programs almost instantly. Members of a workgroup can work together on an unlimited

macros from other programs

The new generation of PCs

will run OS/2 with Presentation

And finally every kind of program, from spreadsheets to elecworks in a common way. To the user, learning one is a quick step toward learning them all. To the corporate bottom line, it means far less valuable time and money

But the real practicality of the graphical user interface comes to life when, inevitably, it appears on every computer screen, everywhere. And networking becomes not only possible, but required in this competitive world

When you think about it, the goal Microsoft set in 1975 of seeing a computer on every desk and in every home seems close at hand, Because, at Microsoft, our fierce pursuit of technology

crunching that it has unnaralleled acceptance in corporate America, More powerful than any other, it also easily delivers sophisticated charts, graphs. text and data pulled simultane-With Windows giving laser ously from several sources. And to make it even easier we built it

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comes with a promise to keep. Making it all make sense.

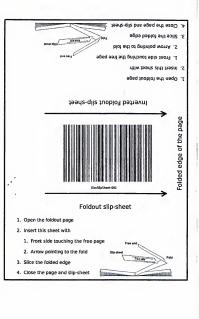
Microso Making it all make sense:



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printers their marching orders, all manner of documents take on

to graciously accept files and



J. Follow instructions on the other side

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1. Follow instructions on the other side



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The philosophy behind Microsoft includes another, equally important, notion. That

soft includes anot important the important the green... gave... gave... grint... Change... the About...

Easy commands from pull-down menus make window-shopping easy.

t, notion. That all the technology in the world doesn't add up to a hill of beans unless it is practical, useful and, above all.

unidov-shophing cos; easy.

Unless it makes sense.

That's why, whether you're
using a Microsoft application
on a Mac, an MS-DOS or even
an OS/2 machine, it will have a
comforting familiarity. Because
today's computers share a
common software guardian.

Microsoft.
Thanks to our groundbreaking work on the graphical interface for the IBM
PC and its compatibles, virtually every personal computer
can give its user a
simpler way to
get a lot more
done. With a
screen that
thinks in pic-

tures instead of words, arranged like papers on a desk. Naturally,



Microsoft* Making it all make sense:

manuscript) you tell IZE not only to return all files containing these keywords in response to a search request that contains any one of them, but to always head the section of the outline with the word that is being defined (in this case, editorial).

The utility of keychangers and keyword filters is greatly increased by your ability to save and name them. They are active only when they are loaded, and you can load and unload them whenever you choose. These tools can color your view of the information in a textbase in much the way that a filter works on a camera lens.

In all cases I found the guidelines, keychangers, and keyword filters easy to use and well implemented. Only one thing is lacking: IZE should generate a file of all the keywords assigned to a textbase. That file should be viewable and editable: IZE currently generates a file very much like this, which it reserves for its own use.

NICE TOUCH The complexity of IZE is rivaled only by the thoughtfulness of design. Nice touches abound in this program. For instance, IZE includes instructions that let you write drivers for programs that it doesn't currently support. If you can run a program from the DOS command line, then you can create an IZE driver for it.

IZE also saves search requests for which there are no matches. On those occasions when I created very complex search parameters, or so completely misselled a keyword that the program could return no matches, I didn't have to completely retype the search field. This may sound like a small point, but it can save lots of time.

SON OF IZE IZE is a promising firstgeneration personal information manager, so it's understandable that it could benefit from improvement. Dynamic linking to external programs is a unique approach to an old problem, and I appreciate having access to a file along with the ability to modify it.

However, it would be helpful for IZE to have a view-only option so that you can quickly look into a number of files before invoking the application program. Hitting the Esc key could get you back to IZE in one keystroke and as many seconds. That

kind of functionality is not unheard of: the new version of *The Norton Commander* can now show *Lotus 1-2-3* and *dBASE* files on-screen, and even *PC Magazine*'s free utility DR. COM displays word processing files.

In addition, Persoft should (and, I am told, will) consider support for LIM 4.0. IZE would be much more useful, and more used, if you could pop back and forth into it. Installed as a standatione program, IZE requires 512K RAM, and that means you really cannot run another major application at the same time. You can configure IZE to run as a TSR, but at a minimum

RAM requirement of 300K, you would have to be congenitally silly to try. IZE requires a substantial commitment of time (yours) and memory (your compute of the work commethy However the page.

of time (yours) and memory (your computer's) to work correctly. However, the payback is a powerful organizational tool that delivers both linear connections between files and contextual outlines. Either gives you new insight into the contents of your files.—Luisa Simone



Memory Lane is a \$140 text-seach utility adment at users with heavy-duty search/retrieval needs. Like GOJer, when the control to the control

work with indexed files. It will perform unindexed searches, but its normal MO is to index a specified set of files and then carry out its retrieval operations on the in-





Memory Lane, Version 2.0 Group L Corp. 481 Carliske Dr. Herndon, VA 22070 (800) 672-5300 (outside Va.) (703) 471-0030

List Price: \$149
Requires: 90K RAM, hard disk, DOS 2.0 or late:
In Short: A text-search utility designed to search indexed files quickly, Memory Lane

works with only a limited number of application programs and printers. It looks like a nice program that didn't quite get finished. Not copy protected.

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dexed file. This approach produces extremely swift searches. A large-scale search involving 6.7MB of data required about 10 seconds in *Memory Lane* and 3 minutes 50 seconds in *GOTer*.

The trade-off for such speedy perforance is twoffold: the time required to create and maintain the index, and the disk space needed to house it. Indexing those 6.7MB of information took about 45 minutes and generated a 1.8MB file. In other words, the space overhead for the index turned out to be about 26 percent of the data indexed.

I obtained these results using Memory.

Lane's higher-performance option. A lower-performance option is said to use about half as much index space but results olonger search times (the Memory Lane
manual says that space overhead may reach 15 percent and 30 percent, respectively, for the low-speed and high-speed alternatives).

Maintaining the index is relatively painless. As you modify data files in the course of your daily work, Memory Lame keeps a list of those files that have changed and prompts you to reindex them. Newly created files can easily be added to the index, and deleted files are automatically removed from the index. Theoretically, therefore, keeping Memory Lame abreast of your data should be a simple everyday chore.



Search "hits" in Memory Lane are shown in 13 lines of context; the context can be expanded to fill the screen.

Because the index file may grow quite large and you may seldom need to search the whole thing, the program lets you break the index up into logical subsets called folders. A folder may consist of a set of files created by a common application, a set of files that have met some particulors search spec, or any arbitrary collection of

Like GOfer, Memory Lane can funnel the text it finds (plus any amount of surrounding material) into your word processor, spreadsheet, database, or whatever else you happen to be running.

files and/or directories. Folders may be added to, deleted from, and combined. Files that satisfy a search operation are automatically grouped into a transient folder to simplify iterative searching.

Search specs may include up to three criteria joined by OR operators. You can embed proximity operators within each criterion, so it's possible to say, in effect, 'Find me Jones within five lines of Smith OR Smith within five lines of Williams.'

MEMORY LAPSES Search specs involving AND circiena require the iterative approach—first you find the files that meet criterion number 1, then you refine that set by looking for criterion number 2, and so no. So far, so good. Memory Lane's iterative approach should be an attractive system for users who need to apply it often and have enough data to warrant the indexing overhead. But there are norbelens.

For starters, you can run the program only as a TSR. It uses only 91K, but even 91K may be too much to give up—particularly for users of Framework III, Paradox, PageMaker, and similar resource-consumine apolications.

A fire more serious deficiency is Memory Lane's embursaingly weak application support. The list of programs that Memory Lane knows how to get information from and transfer information to include the long-frogotten Easy Writer, Framework I, Versions I and I Ao Lons 12-3, and other ancient favoriets. Microsoft Word, MultiMate, Parados, Superacle, and Xybrie are all there—but not in their current revisions. All this from a program whose disk. files are disted March gram whose disk. files are disted March

Memory Lane does include an "application unknown" option, which presumably works with most ASCII text and editors. But if it doesn't happen to work well with yours, you may be out of luck. Printers aren't supported any better than applications. There's no provision for

noncontinuous paper feeding). And for some reason, text sent to the HP LaserJet Plus runs off the right side of the page. On too of these frustrations, the Memo-

ry Lane user has to cope with a poorly written, poorly indexed, anemic manual.

All in all, Memory Lane looks like a nice program that didn't quite get finished.—Craig Stinson



On my kitchen counter I've got the most amazing appliance. It looks like a cross between a blender and a spaceship. It mixes, blends, cooks, juices, and even kneads dough. The only trouble is, I never use it. The manual is about 2 inches thick, and I spend more time figuring out how to master the machine than I do using it.

In the drawer under that same counter, I've got one of the simplest kitchen gadgets ever devised: a walter's corksterw. It doesn't do very much, but I've used it so often that the finish is almost completely own off the handle. Among personal information managers, MemoryMate is my spaceage, lober-saving controlled, MemoryMate does just one thing: it organizes the random ones that would otherwise gather in a pile on my desk, but it does that one thing simply and efficiently.

HAVE IT YOUR WAY Technically, MemoryMate is a memory-resident, freeform text database. You create records by typing text, importing an ASCII flex grabbing text from an application screen. Records can be up to 120 lines (of 80 characters each) long, and there can be more than 32,000 records in each database file. You can create a many separate files as you want. Since it's memory resident, you want. Since it's memory resident,



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MemoryMate organizes random information and presents it through a familiar-looking database-style interface. The menu bar at the top of the screen is constantly visible.

from within whatever foreground application you are running when you hotkey into MemoryMate.

Actually, MemoryMate can run as a standalose application, but that deprives it of one of its main virtues—constant availability. Other PlMs, like Lotus's Agenda and Symantic's GrandView, aren't memory resident, so they demand that you drop whatever you are doing in order to use them. Perrols' 12/E can be used in memory resident mode, but it east a whopping Market Plantive View and the Standalous Market relatively dainty 88K RAM appetite. Under LIM 4.0 it can occupy as little as 30k of DOS memory.

When you hotkey into MemoryMate, you are presented with an unclutured, two-part screen. The top of the screen is a constantly visible menu bar; tapping Esc activates the menu. To execute a command, you either point and shoot or you tap Ctrl and the first letter of the menu

The rest of the screen is a blank area where you can type whatever you want; phone numbers, a letter, or an outline of this afternoon's speech. When you finish, you save the record by selecting Memory—Mate's Save command, and the program gives you a blank screen so that you can start another record.

Each time you save a record, Memory-Mate prompts you for a "reminder date" in mm-dd-yy format. When you hotkey into the program on a particular date, any records that have a matching reminder date

automatically pop up. In this totally painless way, Mornoyflate builds a tickler file. You don't have to specify a due for every record you enter, but this feature is invaluable for remembering appointments and due dates. And although the processor and could hardly be considered a project manguer, you can construct a series of notes that remind you of where you should be in I opport on a project on a given date. Each note but pop up in sequence as you move through the subtasks of the project.

FRUITFUL SEARCHES Memory-Mate's search capabilities most clearly reyeal its power. The program automatically indexes each word in a record. You use the Find command to search for a record by specifying any text string in the record, or by entering the date created or the reminder date. All records that contain the string or match the date pop up, and a status indicator in the upper right of the screen tells how many records have been found. You can step through these records by tapping the Plus or Minus keys on the numeric keypad, or use the Jump command to go directly to a specific record. If your search is too broad and finds more records than you want to pick through, the Narrow command initiates a more specific search of records already found.

Date searches are particularly useful, since you can immediately call up the records that pertain to a certain date. You can also use mathematical operators (=, <, >, and so on) to find all of the records cre-



ated before or after a specific date. One irnitating limitation, however, is that the program lacks a simple way to pop up all of your records at once so you can browse through them. The only way to do this is to request all records created after an arbitrarily early date, like 1/1/11.

AND HYPERTEXT TOO. A recent upgate to Memoryahet sadds one of the PC world's current buzzwords: hypertext. Memoryahet's Hyper command allows you to create links between different databases. Placing a hypertext button is a simple memo-driven process, as is defined nearboard to the process, and the process, and the process, and the precent, combined with memory residential or process, and the process, considered with memory residential or many residential resi

Besides hypertest, MemoryMate has cut-and-paste capabilities and cipibeant. You can move information between records or between MemoryMate and your foreground application. The In and Out commands allow large files to be imported to MemoryMate or exported to the foreground application. Text files that aren't divided into records are imported as a series of contiguous records. Dut that is divided into records of fixed length or delinvided into records of fixed length or delinterior to the control of the control of the control proportion.

A simple forms generator simplifies the creation of repetitive records like phone











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■ PERSONAL INFORMATION MANAGERS

message slips and memos. You create a master record that contains the form template and then copy it into the current record without affecting the master.

MemoryMate will help you organize the avalanche of information that piles up endlessly on your desk, but it won't require you to markedly change your work habits. Any reasonably experienced DOS user can master the program's most important features in a matter of minutes. It isn't as powerful as the more elaborate PIMs, but it may be all that you need.

Jonathan Matzkin



Pro/Tem Software advertises Notebook II in publications like The New York Review of Books and The Nation because it is trying to reach academics, the audience for whom the program was designed. Priced at \$189, this database program understands the needs of its users, furnishing them with a means to maintain bibliographic data and research notes. These two applications give the program its personality, which strikes a balance between obsessive and intuitive. That's because Notebook II offers enough structure to accommodate any form of bibliography, yet lets you enter text in a free-form manner. The result is that a record can consist of one unnamed field that's 50K long.

Like any database program, Notebook II uses files, records, and fields. But unlike a lot of these programs, the amount of data in a field may vary because text entries are not limited by a predefined length and can wrap around from line to line.

Field names, or headings, are listed in a column down the left side of the screen. You can assign up to 22 characters of space to this column, which is separated from the fields themselves. This marks the

Comparison to the process of the pro

In a Notebook II record, the field names run down the left side of the screen. On the right side are the actual text fields. The edit menu is revealed under the text when you press the Esc key.

and of your ability to design a record layout and the beginning of the obsessive side of worknown.—order to a fault. Although this layout work order to this layouther, the thing the property of the property of the mysel, you can be the property of the property and the property of the property of the property sense of the property of the property of the protentory record or invoice. And you can't store spreadsheet data in a row-and-column format.

If you don't want a structured database, the intuitive side of Notebook II can cope. The program lets you create a file with records that have no named fields. Then, by eliminating the heading column, you end up with records that are one field—a blank screen 74 characters wide—that can hold up to 50K of text.

An unstructured record could hold a random piece of data or news, an idea for a project, or a reminder, all of which are unrelated to items in the other records. Yet you can tie records together at any time by creatine a view of your database file.

Every time you change a record, Notebook II creates and stores another copy of that record—although you see only the latest version. Even deleted records are only marked "Deleted"; they are not actually removed from the disk. Because the program works this way, you'll find that your files will grow in size very rapidly.

CREATING VIEWS Notebook II's dexterous ability to create views makes it well suited to managing many types of personal information. The most powerful way to

create a view is to use the Select function, one of ten choices that appear on a pop-up menu at the bottom of the screen. The Select function lets you search your file and link records by a word, phrase, date, or any string of up to 20 characters.

From the Select screen you can choose a field or the neftire record as the search orticion. Then you pick the search conditions. Contains, Excludes, Begins With, NOT Begins With, Less Than, and so on. After that, you center the text to be searched for and a Boolean AND or OR conditions at once, which slows searches down a bit. But by repeating the Select procedure, you continue to you want. Alternatively, views might be merced to broaden a selection.

Views are stored as part of a file. It would be great if you could toggle back and forth between a view and the full database, but it takes a number of keystrokes to navigate that leap. Fortunately, you can edit records while in a view; however, you can't add records

Another way to create a view is by picking individual records that may have no common text. You can browse through your database and select records one by one with the View/Add command.

A Reorder command also creates views. These views contain all the data-base records arranged in a new way. For example, if you have a bibliography organized alphabetically by author, you could use Reorder to sort it by the date published.





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The HeadStart III has two internal drives: a 1.2 megabyte, 5.25-inch and a 1.44 megabyte 3.5-inch, both standard.

So you don't have to Both Standard choose between the two, you use either, depending on your software.

Incredible performance, At the heart of the HeadStart III is a 12MHz 80286 processor with one megabyte of standard RAM, with the hard drive system delivering 32 megabytes of storage operating at 28 milliseconds with astonishing 1 to 1 interleave. Plus, true 16 bit built-in VGA Graphics is component matched for high speed and clarity

Plus, incredible expandability and support. The HeadStart III is designed for your future as well as your present applications, with four expansion slots for networking and for the diverse eripherals already becoming available. With the HeadStart III, you're OS/2 ready right now. You can add two full megabytes of RAM, without

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computer systems, or to find the name of the nearest dealer call toll free You'll see, it really is incredible.

SPECIFICATIONS

2 Dinterfeave BUILT IN INTERFACES: Panillel, 2- RS232 ser mouse, joystick LNGSON SLOTTS: Lauritable

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■ Information Windows With Tornado, you process information in stacks

of superfast "intelligent" windows-several on your screen at once. You type into the windows; interconnect and prioritize them; and scan through them in remarkable ways

Free Form Tomado is FREE-FORM, It works the way you

think. To start a new window you just press N, and enter information. No file names. No extra keystrokes. To retrieve information you just press G (for Get), with any word or phrase-you'll watch Tornado zip through your windows like

lightning linking and opening those requested. You can even flip through your windows with the arrow keys and watch them instantly pile up and lift away. These are just three of 18 easy

but powerful features ■ Countless Uses

There are thousands of use for Tornado, When Harry calls you on the phone, in two seconds flat you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information Tornado is so versatile vou can write and print a letter faster than ever, track things to do; edit electronic mail; and plan a project or eventquickly and easily. You can even build a sophisticated "knowledge" base or an unstructured data base without programming. And that's not all. Track phone conversations, numbers,

tomers, and all your other RANDOM information. On a portable, Tornado is your ideal moving office. Best of all, you tailor Tornado to your own needs easily!

■ 25,000 Windows

nstead of one window or ten, imagine up to 25,000! It's like extra memory...for your brain! The uses are endiess. If you can "type" it-you can "Tornado" it. And because it's memory resident (if you choose) you can quickly jump in from other programs-even move information between them. All this power, ye reviewers agree you can start "Tornado-ing" in 15 minutes-not 15 days.

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You can also use the Reorder command to change the original database without making a separate view, or to change the order within an existing view.

The one unfortunate aspect of the view function is that views are deleted when you compact the database to shrink the size of your files and improve the search speed.

NON-BOOLEAN SEARCHES Notebook II lets you conduct simple, non Boolean searches with the Find function. You match a word or phrase to text in a particular field. Find also works on the record as a whole. It will operate either forward or backward through the database from whatever record you're viewing. Once the first match is found, the Shift-F4 combination

will bring up succeeding matches. Notebook II has a relatively flexible report writer. You can print files to the proper in the database. Or you can coasonize the format of a report by placing selected field data unywhere you want on a page, adding beaders and flooters, and entering peaked on the process of the property of the peaked on every record. Although the programs doesn't offer many printing enhancements, it does let you underline text, justify text within a column area, print out the record mumber on each record, add

Should you want to edit your database files using your favorite word processor.

Notebook II lets you export ASCII records or entire ASCII flies. Exported files still contain field names and the vertical bar that separates the heading column from the fields. The program can import only ASCII flies or commandering flies. The contained flies into the contained flies and the contained flies fl

MASS AFFEAL To buttress the appeal of Netebook II as a manager of bibliographies. Pro'Tem offers two companion programs: Bibliography and Convert. Bibliography constructs a bibliography based on a comparison between citations in a manuscript and Notebook entries. It costs of Notebook III. Convert takes information (usually book and article citations) from Dialog, BRS, and Mediline on-line databases and past in the Notebook format for importing. This option costs \$75 or adds \$25 to the combined cost of Notebook and \$75 to alcohologies.

Bibliography.

Notebook II has its faults. Its structure
can limit the way you design a record—unless you eliminate fields altogether. Gleds altogether, and
you can't search across database files, sepreadheets, or preserve views after the
database is compacted. But the program
senough flexibility, and its searching methods are thorough enough, to make it
useful for many personal information management applications.
—Henry Ferske-Weiss



If Windows has a failing, it's that Microsoft built in too many free utilities and applications. For example, if you need to



jot down appointments, reminders, to-do lists, or random notes to yourself, there's a way to do it in Windows, primitive as that method might be. It is Polaris Software's hope that Packfar, its S395 personal information manager, will entice you to forgo Windows' nulimentary procedures for a new set of better-integrated, more-sophisticated tools.

tocined tools. The Mirrors I installation The Mirrors of Wirrors is among the simplest to use. And software is among the simplest to use. And software is a the installation procedure for their own Windows applications; to use the software, whether you want to install the software, whether you want to install the software, whether you have and how it so connected, and what video display system over the software you can install PackNar in as little time as it take you can install PackNar in as little time as it take for the installation program to copy the files to youre hard-incompared to copy the files to your hard-incompared to copy the files to your hard-incompared to the program to copy the files to your hard-incompared to the program to copy the files to your hard-incompared to the program to copy the files to your hard-incompared to the program to copy the files to your hard-incompared to the program to copy the files to your hard-incompared to the program to th

If you're not already using Windows, to don't assume you'll have to discount Pack-Rar. Polaris supplies a Windows286 runiem module that will encase its software in a Windows shell. (On machines slower than the typical S-MHz 286, you'll find that PackRar and Windows run in what seems like slow motion.) I installed the package under Windows 2.0 and Windows1806 without incident.



A PackRat index card entry can be as small or as large as you'd like it to be—as long as it's less than 32,000 characters long. Field names can be customized to reflect the card's content.

CALLING JLL PACKENTS Windows: telforous with a dock a calendar a note-pal, sum an index cust file. Unless, you do some manual labor, these utilities are disjointed, working independently of one animal barbon, these utilities are disjointed, working independently of one animal barbon, and the properties of the propert

With no real phone-logging system, I have spent the better part of the last 2 years entering names, addresses, and phone numbers in a Windows card file. It will book to an auto-dialer, and with Windows' notepad beside me, I could jot down notes as the need arose. With PackRat I just click the name of the person whose number I want to dial: PackRat does the dialing through my dialer, starts a time log, and leaves me a broad expanse of white space in which I can do all of the doodling I want. The only drawback is that PackRat cannot import my Windows files directly because it knows ASCII and Windows dose not

PackRat's phone log system is a consultant's dream come true. While the system won't calculate a fee based on the time you've spent on the phone, it does provide ample space for recording details of conversations as well as offering automatic

date, time, and number stamping. Well, you can have almost everything.

BEST OF BOTH WORLDS. Post-Rev. In index and system is phenomental in it class, combining the better elements of a local section of the sectio

You can, optionally, apply your cashor file labels old of the index cards you'll be using or just to the individual and you're currently filling out. You can create a catalog of these custom labels and have several different field structures for no field structures at all) included within one card file. When you've entered the field data or keywords (either of which is exactly a) into for possible recall parameters exactly a just of possible recall parameters exactly a just of possible recall parameters that the card of the card

A BIT BEWILDERING I found Pack-Rat's concept of agendas and tasks a bit bewildering at first because I assumed that a task would have a subordinate position to an agenda. PackRat, however, treats them as separate entities and places slightly more emphasis on time tucking for agenta das han for tasks. You handle tasks in the same manner as you might organize a small-scale project-management time line—with attachments and dependencies that are assignable to people found in the phone book or to other tasks that must proceed them. Agendas emphasize starting times, such as the time a meeting should begin, and may be assigned to people.

There are other small annoyances. PackRat's phone book limits you to using at most 30 characters for personal and company names, which isn't a major flaw-it's just irksome. In fact, the only unbearable portion of the entire program is the calendar display. While I am pleased to know the current day and date, and to know what chronological day of the year it is. I am troubled that there are, as of this writing, only 103 days left (until the end of the year, of course, but the program never tells you that). I can't help wondering what will happen when there are no days left at all. These minor points aside, PackRat is the personal information manager of choice for Windows users. -Bill O'Brien

PC-Hypertext
Tracking

In the world of hypertext and PIM architectures, PC-Hypertext, from Max-Think, more closely resembles a carpenter's gothic than a Frank Lloyd Wright design. That's because PC-Hypertext is a system that you build yourself out of three separate MaxThink, products: MaxThink, Houdini, and HyperLink. Whichever combination of pieces you use, the system you end up with can be as eccentric as you wish to make it.

MaxThink, an \$89 outline processor, is the easiest of the three building blocks to

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This sample hypertext system, developed assing Max Think, Houdini, HyperLink, and PC-Hypertext, shows the current topic level and the available choices, including topic titles and specific articles. If you select one of the articles, the program will call up and display the file named to the brackets.

describe. But it's an outline processor in the same way that a 25-MHz 386 machine is a fast calculator—both do so much more. MacThink lets you create, edit, and print outlines, move blocks of text up and down levels, and about a hundred and one other things.

For example, MaxThink offers you a series of "brainstorm" commands, which allow you to sort topics, put them in priority sequence, or randomly scramble them again so that you can take a fresh look. You can even perform a binsort, which lets you set up heading topics as "bins" and then rapidly assigns each topic in a list to the appropriate category.

MatThink also has a REF command, which builds an alphaebited list of every word in the outline. You can enter a reference to an ASCI for FC Paint or FC Paint or FC Paint or Minh your outline. There are facilities that let you quickly load display it from the you quickly load for the real facilities that let you quickly load for the total you confident the soft of the paint of the

MORE MAGIC Houdini (\$89) is a little more difficult to describe. Whereas MaxThink creates information outlines composed of topics, Houdini creates knowledge networks composed of nodes.

A typical Houdini application might involve mapping the relationships between

case law and deposition statements, or dumping in sketchy details about characters, plot lines, and settings and then exploring different combinations and interactions.

A Houdini network can be as simple as a hieranchical outline, but it can also be much more complex. Information elements, or nodes, can relate to one another in any of five different ways based on how their connections are structured. Since these structures can be interconnected, you can create elaborate and extensive information networks. If this sounds as if it might be difficult to execute, it is. Don't expect to master Houdini in one aftemoon.

Fortunately, Houdini uses many of the same commands and user-interface design elements as MaxThink, including the ability to display the contents of ASCII, PC Paint, and PC Paintbrash files. There are a number of ways that you can view the nodes and their relationships.

THE FINAL LINK HyperLink is not somethan single product as it is a continuous of related utilities. This S89 module has programs that let you move MacTina and Housdin networks into the pyetrext natives. Since the PC-Hyperrest system is designed to connect separate files, HyperLink has utility that automatically designed a large text file into many smaller ones. Another programs creates cross-reference lists for each file and then combines them into one long list.

HyperLink also includes an ENCODE

program, which compiles text files into a hypertext system that can be used with Pc-Plysertext. All jumps are established by placing a filename between the left and right angle brackets. The files used by ENropid to the program of the program of the pable of writing ASCII files. PlyserLink even includes a utility designed to make a mini-expert system out of a hypertext network.

Once you have put all your links in ENCODE, you were the results with ENCODE, you were the results with PC-ENCODE, you will not be the put and the

PC-HYPERTEXT AT WORK How well do these programs work? In testing all three, I created a hypertext system using a sample data file containing abstracts of PC Magazine articles. First I inserted the to-kens required by the file-separating pro-







program.

Requires: 256k RAM, bard disk, mono-chorene or GA monitor, DOS 2.0 or later. In Short: Powerful, separate collection, and programs and useful utilities, this set of produce uses and unefact utilities, this set of produces can turn files or ASCII let air information into outlines, knowledge networks, and hypertent systems with relative case and extraordinary speed. You'll want a good test deliver to go along with some of them, but owerall they offer excellent value and capabilities. Not capy protected.

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DISTRIBUTING CORP. 327 Office Plaza Drive Tallahassee, Florida 32301 Telephone: (904) 878-8564 Telex: 6714280 KLON Link utility to split the text into 53 files.

The file-splitting process also produced a full list of the file descriptions and names in a form that could be entered as a Mariani and the control of the country of the

Instead I chose to create some of those links by using my favorite diffor to insert the desired filenames in brackets. I then converted the MaxThink file into the hypertext network format, compiled it, and was able to use the resulting system immediately. It was not a particularly complex system, to be sure, but it took less than 2 hours to create a useful application.

BUT SITA PIM? In the end I would be bestiant to think of a hypertext knowledge system as a personal information manager, simply because the effort required to create a complete system is inordinately large for the result. If you are familiar enough with your information to be able to devise all the interconnections you'll need, you conducted achieve similar results just by using Hou-

HyperLink and PC-Hypertext shine as end-user reference engines that you can load quickly and easily. MaxThink is a tremendously helpful, multipurpose personal-information-management tool that can be used for such wide-ranging tasks as creating to-do lists, problem-solving, and manasine your hard disk.

All three programs have essentially the same user interface, and all work with straight ASCII text files; the same commands are available in more than one program. Together they represent an outstanding value, costing less than some other products reviewed in this issue. If you need to organize your own information, or if you need to understand the inter-clustons between elements in a large collection of items, or if you need to create the contract of the co

P C Outline
Tracery
Tr

Drown Bag Software's PC Outline is so powerful and flexible that it may be obtained as if you have five programs rather than one. Not only is the S89 95 program an excellent outliner; it is also a simple project manager, time manager, dardsware manager, and word processor. What's more, you can see these application files at the same time by opening PC Outline's time with moves. All this functionality is encessed in a program that is easy to use, has a very apprehimately than the program that is easy to use, has a very apprehimately managed to the control of the project of the program of the program

You access PC Outline's program functions through pull-down menus; bokies lead to option boxes. The program offers you a number of way to a number of way access menus; by using the lns key and then served in the served in thes

You can invoke menu functions by scrolling or using the first letter of the command; often you can use shortcut keys to bypass the menus. Shortcut keys are listed on the menus alongside their respective functions, making them easy to learn as you use the program. PC Outline is also able to redefine keys as macros, allowing you to repeat common outline elements and their subelements or invoke templates.

CREATING OUTLINES When you select Create New Outline Entry option or Ctrl-N or Ctrl-Enter from the Outline menu, PC Outline automatically assigns outline numbers as you type in your text. The default numbering system places capital letters next to top-level headlines, but you can easily change the style to Roman

numerals as well as use Roman numerals at any other level. In addition, you can use lowerese letters and cardinal to the processor letters and cardinal to the processor letters and cardinal to the processor letters and the processor letters are some some processor letters and the processor letters are all producing offers you several ways to eliminate outline marks after they have been recorded.

ter uery nave-ocen recorded.

The program also lets you add explanatory text to your outline at any your insimply pressing the Return key to start a
new line. You can use a battery of bloadciding and formatting commands to adjust
individual outline elements, families of elments, and free-form text. And as you
would expect, when you issue move commands to reorder your outline, the whole
outline is renumbered to reflect those
channes.

One of the big advantages of using a computarized outline is that you can had the sublevels and show only summary entities that Sociasing your reader's attention on the major or unconfidential points of your couline. You can always open up the portions you or your reader wants to see in detail. In this, PC Outline gives you feel flexibility, allowing you to hide and show individual elements, levels, or test. The gray Plus key toggles back and forth between hiding and showing elements.





Cutting and pa. files is very simple with PC Outline, In the screen shown here, two of the windows have p of the same file while a third shows part of another file. The software can displa up to nine windows at once, but only one is

A MANAGER'S TOOL Because outlines provide a systematic way of defining and summarizing relationships among items, their application extends beyond such obvious uses as to-do lists, phone and address lists, notetaking, and the like. They can be used as simplified substitutes for some common standalone applications, such as project management, time management, and database management. In fact, the best low-end project management programs are now incorporating outline views into their methodologies.

PC Outline makes a noble attempt to act in each of these capacities. As a rudimentary database manager, the program allows you to enter secondary fields of information as part of an outline entry. So, for example, you could set up a customer list with secondary fields for last contact date and the number of the promotional letters a contact received. You could then sort the file by either of these fields to determine when or how you should recontact your customers. All the while you'll be reaping the benefits of the program's outline format because you'll have maintained detailed free-form notes about your dealings with each customer.

But there is one annoying glitch in this process. If you have titles in your file, the sorting routine puts the title line at the bottom of the list. Then you have to go through several steps to neaten the file after a sort. If you have more than one line of titles, this process becomes even more complex and time-consuming.

Setting up columnar fields is the key to using PC Outline as a project or time manager. For project management you could set up fields for the name of a task, its duration, due date, the person responsible for the task, the resources involved, and the cost. Subtasks would be listed under main. tasks, indicating dependent relationships. Explanatory text could follow the fields.

If you manage more than one project, you would have a separate file for each one. Then when you wanted to get an overall picture of your projects, you would load your project files into the program's windows and look at as many as nine projects at once. By opening all these windows, you can easily compare dates and resource usage, as well as transfer data from one file to another. You can't do time calculations or display a Gantt chart of your project, but simple projects-particularly personal ones-don't really require much more sophisticated maneuvering than PC Outline is capable of.

Having as many as nine windows open at once could get confusing if it weren't for PC Outline's List Windows function, which tells you the names of the files by window number, their size, and whether there have been any unsaved changes made to them. You can size and place windows on the screen as you like.

PLUS AND MINUS A crucial part of many applications is searching your files to isolate individual elements or groups of elements that satisfy certain conditions.

PC Outline is adept at conducting a traditional search using a string of text. If you are managing a project, you might use the find and replace commands to update tasks, searching for "Still Waiting" and replacing it with "Done" for completed tasks. Searches are performed either on visible entries only or on every entry in the file, even the hidden ones. But PC Outline cannot conduct a conditional or Boolean search, which is important for almost any database application. That is a major weakness of the program.

A new version of PC Outline, called PC Outline Plus, is due to be available before the end of the year. Priced at \$95, it will contain the Merriam-Webster dictionary and thesaurus. It will also give you the ability to use different sets of editing commands that match the commands in several popular programs, including Microsoft Word, WordStar, WordPerfect, and MultiMate. PC Outline Plus will let you control the fonts and colors used on the screen and will have context-sensitive help. These new features will make it easier and more comfortable to use what is already a very easy and powerful program.-Henry Fersko-Weiss



Primetime Software has chosen to concentrate on a limited area of information management and give it a solid treatment. The result is Primetime Personal, a time-management program that elevates the appointment calendar and to-do list to a fairly high level of sophistication. The \$99.95 program lets you do anything from jotting down a reminder or an appointment to scheduling start and due dates for a number of delegated assignments, all with a minimum of effort.

Primetime Personal relies on a standard



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Primetime
Personal's task
screen shows you
tasks in order of
priority and
classification and
displays the number
of days left until a task
is due. Strikethroughs indicate
completed tasks.

database structure rather than the sort of free-form approach taken by programs such as Agenda. This means you have to call up the module in which you want to store information and enter it as a record by filling in the appropriate fields. Still, the program's intuitive design makes using it almost as easy as grabbing a pencil and a noteous.

The main menu and a calendar are always displayed in the top portion of your screen, while the screen of the module you're currently in occupies the rest. Speed keys switch you from one module to another readily, and a function-key menu at the bottom shows all the options available within each module.

CHECKING YOUR SCHEDULE An appointment module and a task module constitute the core of the program. When you call up the appointment screen, you're presented with a facsimile of a page from an appointment book showing your schedule for the current date with the current time slot highlighted. An N to the right of an entry means there's a note attached to it, which you can read by hitting F4. The size of the time slots defaults to half an hour, but you can change this size to whatever you want. The program even accommodates appointment times that don't fall on a regular dividing unit (such as 3:37), and it lets you schedule concurrent or overlapping appointments.

An alarm reminds you of particularly important engagements; you can control both the duration of the alarm and the amount of lead time it gives you. This feature, of course, is practical only in Primetime Personal's memory-resident mode. But since the program consumes 120K of RAM as a TSR, you may think twice about making it a permanent resident in your

PC's memory.

You can lip to other days by means of the calendar at the top of the screen—one of the program's nicest features. The cursor keys, plus PgUp and PgDn in conjunction with the Shift key, move a highlight from the current date to any other on the calendar. When you release the Shift key, you're presented with the schedule for the date you've selected. Shift-Home moves you back to toddy's date.

Calling up the task screen shows you today's to-do list. When you enter a new task, it normally appears immediately on remove it. You can also enter forthcoming you to-do list and stays there until you remove it. You can also enter forthcoming a later date. If you specify a doe date for task, the to-do list will also show the number of days left until the deadline. The onscreen calendar facilitates dating an entry you automatically lifting a field with the date you've highlighted on it. Another neat south as "20" for "2 weeks from now."

SETTING PRIORITIES You can prioritize tasks and categorize them, but category labels can consist of only a single letter. Primetime Personal also lacks the ability

that Agenda and GrandView have to categorize items automatically according to their content. On the to-do list, Primetime Personal can display tasks in order of priority, category, or due date. Although each item can be no more than 50 characters long, Primetime lets you attach fiveline notes to each item.

One of Primetime's strongest features is its automatic task- and appointment; suppose you want to schedule a meeting for 3 P.M. on the second Wednesday of every month or add a reminder to your to-do list to water your office plants-every 4 days. You need make just a single entry, and the program will automatically add the remaining entries to your appointment schedule or to-do list as far into the future as you specify.

Another option gives you some elementary project management power. You can delegate tasks already on your to-do list or assign new tasks to other people. Simply adding a person's initials to the assignment-code field of a task will mark it as an assignment. I will then not show up on your to-do list until the date you set for no your to-do list until the date you set for

reviewing the assignment.

Before assigning a task, you must add the name and initials of the assignee to the phone book file. This lets the program automatically expand the person's initials into his or her full name when it displays assignment details. Of course, the phone



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■ PERSONAL INFORMATION MANAGERS

book also lets you store phone numbers, addresses, and notes for each entry and allows you to search the list by name. There's an auto-dial feature as well.

To get a list of all the tasks you've assigned—cither under way or not yet started, or both—you use Primetime's reporting facility, which includes all starting and due dates in its output. The report generator will also list all your own forthcoming tasks and appointments or will catalog all completed tasks and assignments. You can send the report to the screen, to disk, or to the printer.

Primetime Personal offers a solid, straighfloward approach to time management. The flexible, intuitive interface shows that the vendor has given a disshows that the vendor has given a lost of thought to how people will actually use each feature. What the package lacks in sophisticated text-retrieval capability, it makes up for in ease of use and low price. For someone who wants to keep organized but doesn't have come on this 4-ob list for digesting complex software. Primetime — Robert Kreadull



Executive Technologies' SearchExpress was an early entry into the text retrieval market and one of the first PC programs to offer hypertext, linking texwith graphics images, scanned documents, and other objects. The powerful search fiscillities of this \$349 program best serve those who need to manage collections of data from a variety of sources.

SearchExpress's documentation consists of a small spiral-bound booklet that lacks the sophistication of the product itself. Details for using the search facility are clear, but a tuorial on searching is scanty and does not exploit the possibilities

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Bit 51. Section States 128 7 27 and 50 to 223 bases

Bit 52. Section States 128 7 25 25 24 to 10 to 10 223 bases

Bit 52. Section States 128 bases 128

SearchExpress word searches yield documents with the target words highlighted. A zoom key takes you to either complete lext, significant paragraphs only (shown here), or significant sentences only.

of the sample documents included. Sections on setting up a user ment to execute external programs, particularly important for users of nontext data, are just adequate. The manual's explanations for hypertext linking are not thorough, especially for

someone new to the concept.

The overall organization of the manual, with front-end addenda for the latest version, is confusing. Fortunately, Executive Technologies' technical support staff is responsive and helpful, overcoming most of the documentation's faults.

SearchExpress works with any sort of data—text, images, spreadshorts, graphics, even digitized sound—and handles input from most popular word processors, including WordPerfect, MultiMate, and Microsoff Word, I used the program with files from several packages and had difficulty working with only one double-colurn XyWrite file. Other XyWrite documents posed no problems.

As each object or document is incorparated into the system, SearchExpress stores a header for it. Case-law text might, need headers that include judge, need headers that include judge, the state of th

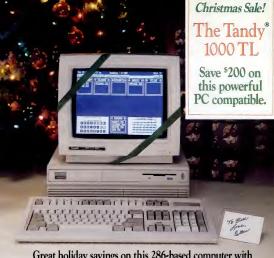
speedy retrievals later on.

As you enter nontext items and set up header information, it is crucial to anticipate potential retrieval requests. Planning header definitions for textual items is less important because retrieval can be based on an index of an item's content, and because the program offers extensive search parameters.

FROM SIMPLE TO COMPLEX The simplest type of search you can conduct is a word search, with particular words specified as required or not. You may also assign a weight to any word, designating its sign as weight to any word, designating its list of the relevant documents ranked in order of importance as determined by the assigned weights. Words are identified by root, so treaty and treatine, for example, are equivalent search words. There are equivalent search words. There have no specific weights of the search words. There have the search words there which is consistent with word meaning.

and with the companies of the companies

The most unusual retrieval option offered by SearchExpress is the search for a similar document. This feature actually



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■ PERSONAL INFORMATION MANAGERS



analyzes the words found in a group of user-identified documents and retrieves a specified number of other documents that use similar words, ranked in order of similarity.

VIEWING A DOCUMENT You can follow any of these searches with an examination of the retrieved documents. You can zoom in on relevant portions of a document by using a function key, and the Read menu lets you choose among several sorting and outunt options.

Access to noticet or external word-processing documents is actually controlled by the external application program. You center an external application program you configure to call up to 16 programs of your choice. This feature words before the programs that accept filenames as parameters issued from the command line. However, I was table to access Jonas 12-23 perseablence using this technique only afform Exocutive Technologies' technical support staff.

Another way to retrieve documents or images is through direct linking. The hypertext function automatically adds linked objects to a retrieval set. Used creatively, linking could even produce an approximation of a diagnostic tree search, narrowing options and moving through linked documents. HERE'S THE RUB All this flexibility takes its toll primarily in space. The program occupies about 450K RAM, although it shrinks back to 20K when running external application programs. In addition, text documents stored in Search-Express may require another 50 to 70 percent of disk space beyond their original size to accommodate index overhead. Moreover, during the add-documents process, disk space of up to ten times the size. of the original files is used as temporary workspace. Users who run RAM-resident programs and also wish to run external programs through SearchExpress should contact the vendor's technical support staff to find the least problematic way in which to do so.

SearchExpress is not a program for novices or cessus users. However, its ability to handle up to a million files of various types, its maleidability, and the special power of its searches are all impressive. Beyond this, Executive Technologies is Beyond this, Executive Technologies beyond the promising not only performance improvement but also such goodies as a notepad feature and a thesaunus to permit searches by meaning as well as spelling. For those who need a librarian extraordinater, SearchExpress filts the bill.—Joy Segalt



List like peering into a file box of index cards. That's because managing the kind of odd bits of information you might write on index cards—nothing more, nothing less—is the mission of this \$99 program from UnionSquareware.

On closer inspection, you can see the tops of a series of cards, fanned out to reveal the first three lines of the note. The top line, acting like a tab, displays subject la-



bels. You can sort the notes into stacks by selecting a series of subjects using combinations of ANDOR conditions. You leaf through the file box by scrolling up or down the screen with the armo Weys. It is a simple, straightforward approach to managing personal information. The simplicity and the index card metaphor are in its flavor, but the lack of structure within the notes can make the entry of often-repeated data believs.

SquareNote's opening screen offers four options: Get or Create a note file, change the Dirpath, or Quit. If you're created a new note file, you have the choice of importing information or writing notes. Imported notes must be in ASCII format and must begin with a validity string of characters: SS<IMPORT>SS. Other character symbols are used to indicate the subject keyword area, the record body, and its end.

Notes can hold up to \$50 lines of inforinformation in what is essentially one long field. You enter data in free-form fashion, which is both an advantage and a disadvantage. On the one hand, you don't have to worry about field sizes. On the other, if you want your fields to have some structure, you have to re-create that structure on each record.

At the top of each blank note screen is space for entering the note's subject keywords. Each blank note has the word Unclassified written in as the first subject. It is replaced when the first specific subject is entered. Each note record can have up to

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Browsing through your files is very easy with SquareNote because it shows the top three lines of up to five note records. The first line of each note contains the subject keywords under which the note is etc...

100 subject keywords—quite sufficient for the most detailed categorization of data.

SPLITTING NOTES You can split a note at any point to create another field, but two text fields are the most you get. SquareNote's developers call this split a perf, for perforation. Text above the perf is called the header: below it is the body. Although in practice header and body text are not treated differently, it does help to use the two areas consistently to speed searches and export routines. For example, you might keep the names and addresses of your customers in the header and comments on your sales leads in the body. Then you could quickly export only the name and address list, or search through the body of the note.

After you've written and saved a note, you'll see SquareNote's main menuscreen, which displays the first line of keywords and the first two lines of text for five note cards. A status line at the top of the screen tells you the name of your note file and the number of notes in it.

Being able to glimpse the first few lines of information on the index cards helps you browse through a file. But if you want to search more ingroustly for a particular note, or a group of notes that contain a piece of text, you can do so by using the CHIPPs[Ju] and CHIPPs[D] and CH

looking for. Alternatively, it will gather all the notes with that text and put them in the front of the file.

SquareNote also lets you search by keyword. You enter subject names in an entry box that can hold three subjects comnected by AND. Only notes with all the subjects in the keyword area will be selected. Then are three such entry boxes, connected by OR conditions. This lets you contain the procedure is finished, the group subject keyword or group of keywords. When the procedure is finished, the group of selected notes is put together in a stack. This stack then becomes your active set of notes.

STACK EM UP Other keyword commads ley you expand the stack, keep only certain notes in the stack, or discard notes. In this way you improve your search. For example, you could build a stack of customer information by first selecting all the noses with New York and Credit noses with New York and Credit not subject area and then refining the selection by keeping only the notes with Volume Buyer as a subject and discarding those with Revenues Down Revenues Reven

If you have a stack that you want to return to again without having to conduct a complex search, you use the Subject command. This command lets you add a subject anne automatically to every note in the stack. Then you can run a select routine on that one subject name to re-create the stack later.

SquareNote's sorting facilities are fair-

by limited. Because there are no formal fields to speak of and the notes aren't numbered, there isn't much material for a sort command to work with. But you can do an alphabetical sort based on the characters in the first line of text—all 72 of them if you want. A second option is sorting by ZIP code. You enter ZIP codes in the header area of your cards and then sort the file accordingly.

When you print notes from Squares, page length, line spacing, and line margins, as well as other basis formatting parameters. That the property of the propert



66 Quick, where d I leave those references to the merger talks? I've got to run to a meeting, and I need every scrap of information I've stored on-disk immediately."

Hmmm. Sounds like a job for The Text Collector, a \$69 program (with a 30-day unconditional money-back guarantee) that's geared up for quick operation, making it exceptionally convenient to change search and output parameters.

A simple program to use, The Text Collector works with a wide range of file formass but comes with predefined settings for working with WordStar, WordPerfect, or MutiMate files. The files that are necessary to run The Text Collector total just under 100K, so you shouldn't have problems

WHAT YOUR ACCOUNTANT MIGHT NOT WANT YOU TO KNOW*

*Andrew Tobias' Tax Cut lets you prepare a professional quality tax return yourself – even if you're a novice at tax preparation.

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Works like an easy interview

Unlike other programs, Tax Cut "interviews" you in friendly layman's terms and without IBS jargon – the same way an empathetic accountant might. It uses your answers to automatically select the schedules you need, and then computes and prints your tax return based on current tax law. All you do is answer, sign and file!

You answer each question only once. Tax Cut automatically transfers the information to overy line or schedule where it's needed, and performs computational checks to make sure your answers are consistent.

your answers are consistent.

With Tax Cut, you need not see any IRS forms until the program prints your return. (If you do wish to review the forms on-screen, just

use the easy display feature.) Saves you valuable time

With Tax Cut, even the most complex tax returns rarely take more than one hour. Compare that to time-consuming trips to an accountant. Or treks through the January solution to the compare that to proper forms from the IES office. Or the time-burning tedium of mistake prone manual preparation, which has you transferring the same information from line to line and form to form line to line and form to form line.

Saves you money, too

Tax Cut helps you know what financial decisions to make them, for maximum tax savings. It eliminates the mathematical errors that can result in overpayment. It checks to see that you don't pay more FIGA than you should (a common mistake). And most important, with Tax Cut there's no more need to spend significant amounts of money for professional quality tax preparation you can easily do yourself.

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Tax Out is written by a team of tax professionals and personal finance expert Andrew Tobias. Together, they bring you a program that is fully comprehensive and current, yet simple enough for even a tax novice.

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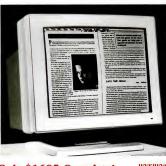
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After a successful search, The Test Collector displays single lines from blocks that contain the data specified in the selection criteria. The full path for each file is also displayed (in this case all blocks)

were in the same file).

running the program from a single floppy disk—assuming you can fit the files you want to search and the output files on a single disk.

To use the program at its most basic level, all you have to do is enter a search string, specify the file or files to look at, and give the program a name to use for the output file. Then you hit lenter, and the program takes off. When it finishes, you can browse files, tag and save selected portions of files, or print all or parts of files.

OPTIONS ABOUND For more-complex searches, The Text Collector offers ten different option screens through which you can define such items as record delimiters, special search settings like case sensitivity and phonetic searching, and various file-saving and-sorting options. These choices can be used for the current search or session only, or can be saved in a configuration file for future use. In addition, the program lets you sort directories, control printing and video options, and customize its browse mode to include or exclude specific kinds of characters.

You select options before a search begins, although you can always interrupt a search, change the settings, and then start the search again. You can specify options in three ways: by pulling up an Options Menu screen and then selecting a specific menu by number, by issuing Cul-letter commands, or by using the PgUpTgDn (beys to scroll through the various menus.)

acysto sector labogar ne variets incina:
The manual hat comes with The Text
Collector's competent but, as you would
september to support the sector of the s

By specifying the appropriate parameters, you can run The Text Collector directly from DOS. For example, typing TC MERGER C:\NOTES*.* C:\GRAB. TXT-B at the DOS prompt tells The Text Collector to search for all instances of the

word merger in all of the files in the c:\notes subdirectory and to store the results in a file called GRAB.TXT located in the drive C: root directory.

THAT'S ALL, FOLKS If your idea of the perfect personal information manager includes an outliner, hypertext, time tracking, and project management capabilities, look elsewhere: The Text Collector's sole purpose in life is to search files and collect text. You also can't use the program to develop applications for other users. If, however, all you need is an easy way to scan files, look for references to specific information, and save or quickly print out the results of your search, then you're on the right track. The Text Collector doesn't have all the bells and whistles of the more costly and wide-ranging personal information managers, but its low price, minimal memory requirements, flexibility, and ease of use make it well worth your consideration.-Bruce Brown



MicroLogie's Tornado is ironically Inamed; unlike the twister that sent Dorothy's life spinning into disarray, this 599.95 program introduces order. It organizes the small-to medium-sized pieces of random information that would otherwise only up scattered among various directories on your hard disk or, worse, piled in a heap of pager scrans on your desk.

or paper seriage on your cess.

Like Broderbund's MemoryMate, Tornado is a pop-up note taker. Both are easy
to use, powerful, and—most important—unlikely to demand very much of
your attention as they quietly coax order
out of chaos. Except for a few significant
functional differences, the two packages
are nearly identical on a feature-for-feature
basis. What retally sets them anart ure their

FILE The Text Collector. Version 1.5 Text O'Netll Software Collector P.O. Box 26111 San Francisco, CA 94126 (415) 398-2255 List Price: \$69 Requires: 128K RAM, DOS 2.0 or later. In Short: A low-cost, simple-to-operate text-retrieval system, The Text Collector is good for finding all possible entries of any string of characters. It is a good buy, but don't expect to use it for fancy personal file handling. Not copy protected.



Tornado's "records" are The current wi is in the contrasting

user interfaces. While MemoryMate looks in many ways like a traditional database. displaying one record at a time, Tornado takes another route.

OPENING WINDOWS Instead of using conventional full-screen records. Tornado stores information in what MicroLogic calls windows. After hitting Alt-J to enter Tornado, you can then tap N (either upperor lowercase) to open a new window, which begins as a small rectangular box on your screen. That window works just like a mini-text editor. You can type in whatever information you want, whether it's a grocery list or a paragraph of thoughts to remember for a meeting. To save the record, you tap D to invoke Tornado's disk menu and S to save your window. All of Tornado's commands work this way. You invoke a series of menus by tapping the first letter of the menu: typing P brings up the print menu, for instance. Then you invoke the command by tapping its first letter as well.

If you want to enlarge your window, you simply tap Esc from inside it; the window can then be sized with the arrow keys. A window can take up the entire screen if you like; this makes Tornado look like a full-screen editor. It does quite well as a simple text editor when a window is enlarged to full size.

After sizing your window, you can tap E. for edit, to continue entering text, or you can tan Esc a second time to leave the note altogether. Tapping N initiates a new note, and you are off and running again. Once you have entered a number of notes, Tornado displays, in either tiled or overlapping format, as many as will fit onscreen at a time. The current note is displayed in a contrasting color. Hitting E brings you into that note so you can add to it or make changes. Tapping T (for "throw out") deletes the note.

A VISUAL SEARCH By displaying up to 28 windows at a time on-screen, Tornado gives you instant visual access to a large chunk of your information. When you pop up the program, you immediately see many notes, though some of them may be partially or totally obscured. When you are not editing a specific note, you can browse through the notes on-screen with the arrow



keys. As you work through the "pile" of notes, as Micro Logic calls the database file, the notes nearest the top are replaced on screen by others deeper in the pile. In this way you can often find exactly what you are looking for with a simple visual search. This is not as easily accomplished in MemoryMate.

If you have a specific note in mind and want to get it quickly, Tornado's simple search function will find it. After making sure that you aren't inside a particular note, you hit G, for "get," and Tornado's elegant search screen replaces the note pile on-screen. The search screen has two main components: a keyword field at the bottom and a row of tiny squares that represents your pile of windows. Each square represents a window. As you type in a search string, squares begin to disappear as notes are eliminated from the search. By watching the row of squares, you can always tell how many windows match the search string that you have entered. If you are searching for windows with the word marsupial in them, you may find that Tornado has narrowed the possibilities to only a few after you type in marsu.

If so, you can tap Enter and use the arrow keys to browse through this sorted pile until you find the window you are looking for. If your text string narrows the pile down to a single window, you don't even have to bother hitting the Enter key; Tornado automatically pops it up. Once you are finished looking at the window or windows you have searched for, Esc returns you to Tornado's main screen.

Obviously, Tornado's piles of windows correspond conceptually to the database files in MemoryMate or any other database, and windows are really just records. You can easily create up to 50 files of records, so you have considerable flexibility in organizing your information, Tornado occupies 57K RAM, plus the space needed for your data.

MORE SIMILAR THAN DIFFERENT Tornado lacks a few of MemoryMate's

nicer features, including the ability to painlessly generate a tickler file and to create hypertext links. And its cut-and-paste facility works only within windows. Tornado's import and export facilities are a snap to use, however. With just a couple of key-

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Other spreadsheet programs are so difficult to learn that most users master only a fraction of their real potential. Instead, Silk's on-line screen tutor treats you with kid gloves. It will make you a power-user in a few sessions without ever studying the manual



Beyond 1-2-3 Silk is simple to use but powerful. It maintains the spreadsheet features that made 1-2-3 so popular but adds what

1-2-3 and the others lack Silk lets you build formulas as large as 1,000 characters and append each cell with text notes, so you'll always remember

what your calculations are based on. Silk has its own unique screen editor that lets you edit large cell contents-even formulas up to half a screen long. No

other spreadsheet can. Auto Allocation

Silk even has a powerful new allocation feature that automatically distributes values proportionately over any number of cells you choose for any reason you wish to cut the pie.



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■ PERSONAL INFORMATION MANAGERS

strokes you can pull an ASCII file into a window or export a window as ASCII text. I often use this facility for small editing iobs, such as modifying my AUTOEXEC .BAT file.

There are more similarities than differences between Tornado and Memory-Mate. Which one you choose depends largely on whether you prefer a single record interface or Tornado's multiwindow approach. Either program, used aggressively, can liberate your desk from those nasty piles of Post-its, phone messages, and to-do lists .- Jonathan Matzkin



W ho-What-When, from Chronos Software, is a relative newcomer, but the \$189.95 program's sensible approach to time management and project tracking is as old as the calendar-the metaphor on which the package is based. The program does much of the work involved in tving together names, phone numbers, and calendars in a meaningful way.

To anyone whose everyday tools include a pocket calendar, a to-do list, and a Rolodex, Who-What-When will look familiar. The program's start-up screen resembles a page from a "Day at a Glance" booklet and is divided into four columns: When, Who, What, and Description. The first item you are asked to enter is When. You can flag any entered time with an alarm that beeps persistently 15 minutes before a scheduled event, unless you instruct it otherwise. If you haven't assigned a specific time to an entry, Who-What-When fills in the When column with the generic words TO.DO.

GETTING ORGANIZED Who-What-When's TO:DO feature offers you a very clever way of prioritizing and delegating | short names of up to 8 characters to people



Who-What-When re-creates fam oking office to on-screen. It is especially helpful in handling projects, the way it is being used in the screen shown.

tasks that are not time sensitive. You can assign TO:DO chores one of four rankings. Chores ranked either A or B will be automatically rolled over to the next day's calendar if they don't get checked off. A ranking of C is for tasks that should be taken care of today because without your intervention, they will not be carried forward to the next day's list of things to do. This category is appropriate for tasks that aren't too important or that must be done within a limited time frame. Entering D. which stands for "delegate," accomplishes two things: a job is assigned to someone else's calendar (which you may view), and a reminder appears in your calendar on the follow-up date, Who-What-When's cross-referencing capability is neither hypertext nor a shared-calendaring system, but it is a step in the right direction for a single-user

WHO'S ON FIRST Bookies and bachelors have long realized the importance of the well-organized black book, and the card file is the backbone of many business ventures. Who-What-When incorporates the Rolodex idea and improves on it. As you enter the names of people involved with a project, the program pops up a cardfile template, with plenty of room for notes. Going a step further, Who-What-When can print card files in kolodex format and will dial your phone from the calendar, the phone list, or the card file.

Who-What-When asks you to assign

and up to 11 characters to projects. When you enter a new short name, the program pulls up a new blank card file, where you can enter all the pertinent information about a person or project. If you forget a short name, typing "?" pulls up a list of people or projects.

WHAT'S ON SECOND Anyone who has tried to use project management software for small-scale projects and has found it to be overkill will appreciate Who-What-When's simplified approach. The package offers reports for phone and address lists, saves information in exportable formats, and produces project time-line re-



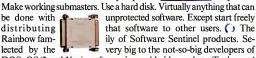
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■ PERSONAL INFORMATION MANAGERS

ports in Gantt-chart format.

Projects are defined in the What column. They are indexed by their short name and can have subprojects. To start a project, you name it, give it a descriptive subtile, and assign beginning and end dates. By defining a project over time and by person, Who-What-When sets up links that can be graphically displayed and printed. You can view the time bars of several pro-

son, Who-What-When sets up links that can be graphically displayed and printed. You can view the time bars of several projects or cross-reference a person and view the tasks by individual commitment. From the time-bar-summary level, you can 'drill down' using the F9 key to the calendar event associated with a project or person and add or edit a task.

A description column allows up to 90 characters and is essentially the comment field for the Things to Do list you create on the Daily Calendar. If you need more space, Who-What-When lets you attach men to the projects or tasks and notes to card-file entries.

Who-What-When distinguishes itself in the reporting eategory. Typically, reports are the last thing you design for a database application and the first thing you need, and the property of the property of the make reports. Nor will you have any rotuble seeing your reports in print: the program supports many popular printers and the HP Learclet Series II. In addition, the coursentation comes with a note-book that information when you are away from your computer.

TROUBLE IN PARADISE Who-What-When does have a few shortcomes, First, Who-What-When loses points for most. In the version of the program we tested, the auto-dialer recognized only? - or 10-digit phone numbers. If you need to dial 9 for an outside line or 1 for long distance, on useful access codes for MCI and the like, you are out of lock. A spokensam for Chronos Software said that the company is control to the company is a control to the company is

Then, too, unless you adopt a naming convention and make sure that you stick to it, you'll find that you're left with a slew of unmanageable and nonsensical short names. Even more important, if you as-

EDITOR'S CHOICE

· The choice is yours

When the attributes of a product category are clearly defined, deciding which product or products deserve the accolade of Editor's Choice is relatively easy: those that possess the best mixture of features and functions, offer the best performance for the price, and represent the best design efforts of their class usually stand far from the madding crowd. In the case of personal information management software-a product category in search of a definition—the best program should have all of those characteristics, but even more important it should be the

one that works for you.

Of the 25 programs we reviewed, several became personal favorites, but none could be considered everyman's personal
information manager. We liked Lo-

information manager. We liked Louse's Agenda for its caregoristic matching, and viewing capabilities as well as for its use of item parsing, an Al technique that allows the program to automatically match they so categories. However, the steep searned of Agenda's learning curve may keep you from doing any real work for a while, undercutting the program's effectiveness as a personal productivity tool.

Symantec's GrandView is the outliner to beat all outliners, offering the kind of intelligent printer support you'd like every program to have. Trouble is, the program's "outline-centric" approach probably won't suit users with different comitive styles.

axkSam Systems' askSam is the text daubtase of choice, with impressive reporting capabilities, hypertext, and a powerful search language. Although askSam places no restraints on the way you enter date to get the most out of the program you need to bring to it some experience in conducting searches and a working knowledge of Boolean operators—not eactly everyone's

idea of fu.
Polaris Sofiware's PackRat and
Persoft's IZE come closes to doing
it all. PackRat, which includes a
rantime version of Microsoft Windows, houses seven useful facilities
under one roof, But PackRat is like
ing capabilities aren't as complex
as they could be rat is sunds, any
item in any one of PackRat's facilities
tes can be antacted to phone book
entries, but only tasks can be autoched to other tasks.

IZE is more robust, offering the ability to link dynamically to files created in other applications, retrieve documents using keywords or search strings, and automatically place search results into hierarchical outline form based on the number of files that share keywords. But if your information management needs are more modest-say, limited to searching your hard disk for all the files that contain a certain word or phrase-simpler and cheaper programs like Micro Logic's Tomado and Microlytics' GOfer are also great, and will suffice.

sign a short name inconsistently, you won't be able to trace any cross-references to that short name across people and projects. If you decide to change a short name, you'll have to manually search for and change all other occurrences of that short

name: unfortunately, the program isn't smart enough to make those substitutions for you.

for you.

Who-What-When doesn't break new
ground, but it does tie together some tried
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■ PERSONAL INFORMATION MANAGERS

ways helped people do their work. It may not offer hypertext or outlines, but it certainly can help you manage resources, tasks, and projects.

—Priscilla Tate-Austin

ZyIndex Professional
Trushing
Ten entered ten entered

Picrsonal information can differ not only in content from user to user, but also in form and purpose. For example, while some people need to track tasks, appoints under the property of the p

mation downloaded from on-line systems.

Besides ZvIndex Professional, there are two other versions of the program, ZvIndex Personal costs \$95 and is best suited for indexing up to 500 files on a dual-floppv-disk system. ZvIndex Plus costs \$695 and is targeted at users who deal with lots of huge files, such as large data dumps. Both the Professional and Plus versions can use a \$95 add-on called ZvFeatures, which contains a thesaurus and programs that can select parts of files and save search criteria. The price of ZyIndex Plus includes a license to use the program on a network with up to five workstations. All versions will work on a dual-floppy-disk system, but a hard disk is recommended for the Plus and Professional editions. You must have at least 448K RAM available to run Zylndex Professional.

To give you a sense of what you can expect, the Zylndex tutorial, which comes on a separate diskette, walks you through the program's most basic functions. Noninti-



Once ZyIndex locates matches of specific criteria, yo can browse freely through the files selected. Your specified search criteria are highlighted.

midating and straightforward, it should dispel any anxiety you might have about the program's difficulty as it introduces you to ZyIndex's somewhat single-purpose approach.

HOW IT WORKS Zylnder works by creating an index list of every word and number in specified files, keeping track of what file or files each word is in and where it is within each file. Common words like articles and conjunctions, called noise words, are ignored. The maximum single file size is 64K, but that doesn't count noise words. As a practical matter, therefore, Zylnder should easily handle files up to 100K.

You can build your own noise-word list; the default includes 145 words, to which you can add 110 for a maximum of 255 words. There is also a maximum of 500,000 unique words per index list, which shouldn't be much of a limitation,

The program allows three kinds of indestring: mean, suco, and direct. White mean indexing, a maximum of 64 files can be indexed because that's all that can be displayed on the screen at once. With autoindexing, you create a command files indexing, you create a command files to intoke and what files to intoke and what files the insus the indexing process. "File-only" indexing tracks and files the words are in but not where they are located.

Direct indexing lets you control the indexing process right from DOS. For example, the command ZYI C:\THES-NOTS*.* LOLLAPALOOZA tells ZyIndex to index all of the files in the subdirectory THESNOTS on a disk named LOLLAPALOOZA. If you kept thesis notes and on-line data search dumps in the same subdirectory, the above command would automatically index the files.

Zylndex doesn't reindex files that have not changed since the last indexing; this is a big time-saver. While it indexes files, Zylndex tells you the number of different



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words in each file and the percentage of the job it has completed.

THE SEARCH IS ON Zylndex's second program function, searching, uses index lists to find whatever you specify. A search request can consist of up to 160 characters. A "search within" feature lets you specify the number of words apart two items can be. For example, the expression "friends w/5 court" looks for files where the word

Indexing is ZyIndex's game: it does the job in a no-fuss. no-muss manner, and it's

fast and easy to use.

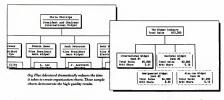
friends is within five words of the word court.

You can also use Boolean operators to conduct more-sophisticated searches, such as those in which the files selected depend on relationships between sets and subsets. But to do so it helps if you have a solid grounding in set theory.

After you enter a search request and the search is completed, ZyIndex displays the number of files containing the requested information. You can then select files by name and browse through them. If you want, you can mark and save or print selected portions of text.

SENSE AND SENSIBILITY Zvindex's approach to finding information is more low-key and less dynamic than that of its closest competitor, AskSam, which takes you to the first occurrence of a search request. But therein lies the main difference between the two programs; AskSam has more of the attributes of a database management system; ZyIndex is above all an indexing and searching tool.

Indexing is ZyIndex's game; it does the job in a no-fuss, no-muss manner, and it's fast and easy to use. If all you really need out of a personal information manager is the ability to do free-form text searching through indexes, it's hard to beat ZvIndex.-Bruce Brown



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LAN GATEWAYS PART 2

▶ Personal and mainframe computers are not competitors. On the contrary, they are increasingly becoming partners: because the technological breakthroughs that bring avances like the 80386 chip to the PCn ave avenes like the 80386 chip to the PCn avenes to been invented in a vacuum, the computing capabilities of mainframes are also continually being enhanced. The demand for links between these computing resources is growing and technology is responding with an increasing variety of solutions to the problem. One of them is a LAN gateway.

In the last issue of PC Magazine, we introduced LAN gateways—products that furnish LAN-linked PCs with a shared portal into the mainframe. In that article, "Building WorkGeneric add-in

LAN gateways can

reside in nearly any

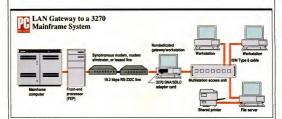
PC on nearly any

PC-based LAN,

complementing the

system you have.





group Solutions: LAN Gateways, Part 11" (henceforth referred to as Part 1), we covered two products that include LAN gateways as part of a total LAN package including a network, file server, and print server; the Harris 9300 system, and Banyan SvINES running on the 80386-based Banyan Corporate Network Server.

Instead of presenting an "ul-li-more on" solution, her products treated in this issue can run on existing LANs. This can be a more flexible and economical appearance of the control of th

The LAN gateways evaluated in this six econsist of three basic things: a special card that fits into the gateway station's fine-traface bus; software that runs in the gateway station, linking the card to the LAN, and terminal emulation software that runs on each PC on the LAN. The emulation of software and gateway software "tialk" through the communications services soft-wave of the network.

NETBIOS Most of the PC-based LANs operating today use the Network Basic In-

put Output System (NetBIOS) to supply network transport services. Increasingly recognized as the standard for PC LAN communication, NetBIOS recognizes and carries blocks of data to and from each station on the network and is capable of communicating over all kinds of network cabling, be it coaxial, twisted pair, or fiber.

optic. Because these LANs use NetBIOS, you can integrate the products reviewed in this issue into a wide variety of networks. and you can even set up and use a LAN gateway on a network that doesn't have a file server. These LAN gateway products will run with equal efficiency on a variety of LAN operating systems, including IBM's PC Local Area Network Program (PC LAN for short), Banyan's VINES, 3Com's 3+Share, and Novell's NetWare. (However, if you need to choose a gateway to run under Novell's Advanced NetWare, Version 2.1, you should check to see if the gateway supports Novell's IPX network transport software in addition to NetBIOS.)

CATEGORIES AND CAPABILITIES
To keep the project manageable, we limited our reviews to products emulating an
IBM 3274 Communications Controller attached to the mainframe front-end processor through a 19.2-kilobit-per-second RS232C link conforming to IBM's Systems
Network Architecture (SNA) protocol
Network Architecture (SNA) protocol

scheme. (See the topology diagram in this issue, as well as the tutorial and glossary that are in Part 1 for more information about IBM's 3270 products and how they work together.)

The inst-bed for our evaluations consisted of a network of IBM PC-XTs connected by IBM Token-Ring Network adapter eards and running IBM's PC-LAW Support Program to furnish NeBIOS services. Typically, this kind of network would also include networking software like IBM's PC-LAW. Die server on the network, we didn't use its services. We used an IBM PC-AT as the gaway station on the net-

WHAT WE LEARNED We experimed problems setting up our test networks, many of hem—despite excellent excellent methods, many of them—despite excellent from the mainfrance end. We learned that there are all manner of arcane variables that must be correctly set in the mainfrance's communications, operating, and security systems before the gateway can communicate. For this reason, when setting up a gateway, destined coordination works of the communication of the contraction of the contract

For example, entities called pacing values must be properly set for gateway communications. Unfortunately, pacing commands can exist in three places in the 3270 communications architecture, and some entries override others. However, if the pacing isn't set correctly, the system won't work.

GLUTTONS FOR RAM We also learned that gateways eat RAM. All of the sales talk about hotkeving between 3270 sessions and DOS applications sounds great until you try to squeeze the DOS applications into the PC while it's emulating a terminal. Most gateway terminal emulation software packages gobble up about 130K of RAM in each workstation, and certain configurations of some products bite over 300K, DOS, NetBIOS, and the LAN redirection software for the workstation easily use another 130K. Additionally, the software that enables the machine to function as a gateway requires over 300K, while NetBIOS and DOS can take up another 50 to 100K.

While almost all of the gateway packages allow the machine functioning as a gateway to simultaneously perform other tasks, we don't think that is a good idea. If the DOS task freezes the gateway machine or if the person operating the machine unthinkingly hits Ctrl-Alt-Del, all of the mainframe traffic is lost, and you might drop the communications line to the frontent processor.

We also observed that it is the software. Must its the key to gateway performance. Some cards loaded with on-board processors were beaten by simpler devices by vitue of the latter's software. We also came to value some of the big, RAM-cating programs. We learned that the reason some of steep programs are so big is to provide seers with features like mensus that make them easier to use. The big programs also often contain error traps, making them more tolerant of communications errors.

GATEWAYS ARE GOOD You aren't gambling your company's or clean's productivity by using a LAN gateway instead of individual terminals or PCs attached to a terminal cluster controller through a coaxist al adapter. There are currently highly competitive, reliable products on the market that can add value to mainframe installations, LANs, and individual PCs by tying them toeether.

ATTACHMATE CORP.

Attachmate Extra!

Part of a versatile line of products from Attentate Cop., a company that is ben in the micro-to-maniframe business since the micro-to-maniframe business since 1982, the Eural 370 gateway is packed part of the products in the industry (a gateway capable of supporting terminals costs \$4,500 and from there the added cost-per-station climbs sharply in comparison with the competition) Attendant's Eural products of the state of the stat

MIX AND MATCH The Interesting new about Eurol is that you can mix and match the line of 3270 products to meet your needs, befinding in gasterny products from IBM and other veadors to customize your installation. For example, the Eurol software will run on the SDLC interface cards sold by IBM and, convenely, IBM software can run on the Attachmate SDLC card for IBM's Micro Channel architecture examists on the second cardiocological control of the second cardiocological cardiocological control of the second cardiocological cardioco

Attachmate's 3270 terminal emulation software has a heavy load of features, but



despite that, each terminal loses only about a minimum of 140K. The software supports a wide range of terminals—including the relatively are IBM 3278 Model 5 terminal that displays 27 lines by 132 columns of text—and automatically senses what type of video adapter is in the PC to moduce the amount of customizing that of the PC to that the PC to the PC to

It's difficult to say how practical it is, but one of the most impressive features of the terminal emulation software is its ability to concurrently display up to four active sessions of terminal emulation, printerulation, and DOS activity in different screen windows. While four windows might be more than most people can use, there are obviously but only for twothere are obviously but only for twothers are obviously software gives you the ability to capture screen images and copy text between windows.

EMULATION EXTRAS Besides coming with many features standard, the Extra! terminal emulation software offers a number of options. Any machine with a CGA adapter can display IBM S3G program symbols by adding the Extra! 3279 S3G Host Graphics option. PCs with EGA adapters can gain IBM 3179G graphics terminal capabilities that allow them to capture images produced by vector graphics image-processing programs on the mainframe. If you want to upgrade your IBM PS/2 computers with the 8514/A graphics adapter and 8514 high-resolution monitor, the Extra! hyperGraph/8514 option will give you the spectacular screens of mainframe graphics programs designed for the IBM 3179G All Points Addressable

graphics display.

Attachmate's 3270 gateway communications software, which takes up only about 270K, includes strong administrative features. The security control available through the gateway is excellent. Nicely designed displays make it quite easy to change session pools and user access. You can also quickly check the status of SNA link communications and Trace operations.

The Extra! gateway uses LU pooling so that each network station can contend for unused sessions instead of having them assigned to specific users. However, if sessions need to be permanently assigned to users with specific capabilities, the software allows them to be.

Although it's hard to beat the quality of the documentation produced by 3Com Corp.'s CSI Division, Attachmate's manuals are excellent: both are clearly indexed and well written. The screen diagrams, which show you what to expect, are particularly good. Attachmate Corp. also maintains a free bulletin board for technical support and has a regular program of seminars for API programmers and system integrators in many parts of the country.

DIGITAL COMMUNICATIONS ASSOCIATES INC.

DCA IRMALAN SDLC Gateway

From the company that made the name Irma synonymous with micro-to-mainframe connections, DCA's IRMALAN SDLC Gateway kit is what you'd expect: an industry-leading package loaded with features. Although the gateway's software takes up a lot of RAM, DCA charges only \$1,995 for a package that connects five networked PCs to a mainframe and does a great job of printer emulation.

DEDICATED OR FIRST-COME Like all DCA products, IRMALAN is well supported and includes good documentation. Providing up to 32 concurrent host sessions that can be dedicated to individual users or pooled for first-come first-served sharing, the IRMALAN SDLC Gateway features a gateway card that is a full-size PC expansion board equipped with an 80186 processor. I particularly liked the LEDs on the card that flash when communications takes place. If you have to troubleshoot the system, these little indicators at least let you know if the software is communicating with the board.

The gateway communications software includes a Trace utility that shows activity



DCA IRMALAN SDLC Gateway Digital Communications Associates In 1000 Alderman Dr. Alpharetta, GA 30201-4199 (800) IRMA-526

List Price: IRMALAN SDLC gateway adapter and gateway software, \$1,195; gateway package with IRMALAN SNA softwar for 5 workstations, \$1,995; IRMALAN SNA Workstation software for an additional 5 workstations, \$1,195; IRMALAN SNA Workstation DFT Start Kit, \$1,495; SNA Workstation Convenience Kit for an additional 5 workstations, \$1,395; IBM 3179G All Points Addressable graphics option, \$595 per workstation.

Requires: Gateway station: IBM PC, XT, AT, PS/2, or compatibles: 512K RAM, Network stations: IBM PC, XT, AT, or PS/2: 512K RAM. LAN with NetBIOS services. In Short: DCA's IRMALAN SDLC Gate way is an industry-leading package loaded with features. The software does an excellent iob of printer emulation and provides many magement controls.

CROLE 652 ON READER SERVICE CARD

ment utilities also show LAN details derived from NetBIOS-like error counts and the status of adapters on the network. These management tools can run from any network workstation, but the machine acting as a gateway loses over 308K of RAM

to the software.

The IRMALAN SNA Workstation software enables PCs to emulate an IBM 3278 terminal (Models 2, 3, 4, or 5) and can handle five concurrent host sessions and a DOS application. Although it requires each workstation using it to give up a minimum of 177K, it unloads from memory easily if no other TSR programs are loaded on top of it. The terminal emulation supports the LIM 3.2 or later EMS standard and includes programming support for HLLAPI.

OPTIONAL GRAPHICS PCs equipped with a CGA can emulate the IBM 3279 terminal (Models 2A, 2B, 3A, or 3B). The optional graphics terminal emulation software gives a PC with a color graphics card the ability to emulate IBM's 3179G All Points Addressable graphics display on the communications line. The manage- | Host-based file-transfer programs are also

available as extra-cost options.

DCA does one of the best jobs of printer emulation among gateway companies, supplying translation tables that make any of 14 popular types of printers look like an IBM 3287 to the mainframe. Other vendors typically support a smaller range of printers, generally starting with the Epson MX-80 series.

If you want to connect more than the five PCs linkable with DCA's basic package to your gateway, all you have to do is purchase additional terminal emulation software packages; for \$1,395 you can connect five more. Besides gateways for mainframe connections, DCA also offers a more limited type of gateway that connects to the terminal cluster controller. Digital Communications is also one of the first companies to bring a new kind of gateway to the market. Called the 802.2 gateway, it is a software-only product that links workstations on an IBM Token-Ring Network to token-ring-connected terminal cluster controllers and front-end processors.

FICON TECHNOLOGY CORP. Eicon Access/SDLC

Headquartered in Montreal and popular in Europe, Eicon Technology Corp. isn't well known in the U.S. Thanks to its unique approach to add-on communications products featuring a low-cost, low-RAM-requiring SDLC gateway, this low profile may not last for long.

The Eicon Access/SDLC 3270 Support LAN Gateway is based on a communications card that carries a Motorola 68008 processor. By downloading different programs to the processor, the card can become any one of several different communications devices: Eicon markets a version of the card for the Micro Channel architecture interface used in IBM PS/2s; Novell remarkets the Eicon cards as part of its X.25 gateway system.

ONLY 8K OF RAM Because it contains its own RAM and is so autonomous, the Eicon Access/SDLC 3270 Support LAN Gateway takes only 8K of RAM in the host computer plus 1K for each session. This means that the \$2 195 Access 3270 LAN Level-1 that can distribute up to 32 sessions

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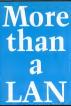
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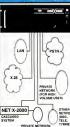
has twice named The Logical Connection its Editor's Choice. In fact, they called it, "...more than logical — maybe inspired."



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■ STANDALONE LAN GATEWAYS

FILE

Eicon Access/SDLC Eicon Technology Corp. 2196 32nd Ave. (Lachine)

Montreal, Oueber Canada H8T 3H7 (514) 631-2592

List Price: Eicon Access/SDLC 3270 Support LAN Gateway for 8 users/32 sessions, \$2,195; 256 users/254 sessions, \$3,195, Requires: Gateway station: IBM PC, XT, AT, PS/2, or compatibles; 512K RAM, Nerwork stations: IBM PC, XT, AT, or PS/2: 512K RAM. LAN with NetBIOS services. In Short: The Eicon Access/SDLC 3270 Support LAN Gateway is one of a family of PC-to-mini/mainframe SDLC communications products. The software does a good job with basic terminal emulation functions. Its specific strength is Eicon APPC-Eicon's add-on APPC application program interface CIRCLE 050 ON RE

across a network among up to eight PCs takes only 40K of RAM in the gateway host machine. A \$3,195 version of the product can distribute up to 254 sessions and occupies only about 262K of gateway

On the other hand, the terminal emulation software takes nearly 300K of RAM on each workstation. The software does a good job of supplying basic functions. It can establish up to nine concurrent terminal and printer emulation sessions from a single PC, and the built-in file transfer program can move files between the PC and the mainframe's IND\$FILE utility in the background mode. Eicon's package gives a PC the power to emulate two types of IBM terminals: a 3278 (Model 2) or a 3279 color display. The company also sells a separate graphics option that lets a PC equipped with a color/graphics adapter emulate a 3279 S3G graphics terminal.

The Access/SDLC package has a builtin scripting capability. There are only ten commands in the script language and there is no error checking or branching, but you can create simple scripts that will sign a PC onto a mainframe session and perform certain tasks automatically. These tasks are managed through a calling directory. In theory, you simply pick the session/function you want from the directory and start to run it. Then you cross your fingers, because if there are any communications errors this script file won't recognize them.

FAST SETUP The installation software for this product is menu driven, and the setup is fast. The gateway software includes a Trace utility that we used to find a communications problem during installation and a Log utility that tracks conversations between the host and specified sessions. Network management commands in the gateway software give control over the allocation of sessions and the communica-

Eicon makes its mark in this industry in its early and strong support for IBM's APPC/LU6.2 program-to-program communications protocol. The EiconAPPC is a separate product that takes about 35K of RAM in the terminals. It is a private implementation of IBM's architecture that is smaller and more flexible than IBM's product. This strong APPC capability and the ready interfaces to various forms of Eicon SDLC and X.25 communications adapters make the Eicon products popular with developers and system integrators.

COMMUNICATIONS INC. Gateway

GATEWAY

Communications G/SNA Gateway

Despite what its name may imply, Gateway Communications sells more than gateways; the company also markets its own local area network interface cards, as well as a customized version of Novell's NetWare, and has earned a good reputation in both markets. Graced with good operational and management features, as well as tried-and-true terminal emulation software, Gateway's LAN gateway packages start at \$2,580 for a system that can distribute a total of eight LUs across a net-

work. The G/SNA Gateway's intelligent SDLC interface card is equipped with an 80186 processor and takes about 75K of RAM from its supporting PC. The gateway communications software includes a

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PCM259



utility program with trace and status-monitoring capabilities.

SAME EMULATION The terminal emulation so fiva-we that comes with the G/SNA Gateway is the same as that sold with the company 3 Binyac and X.25 connections. Each station using it can mu up to four sessions of terminal or printer emulation, and it allows 3270 and Remote John Carrier (RLI) seasons to be combined on Energy (RLI) seasons to be combined to the company of the company o

fer is not used. Along with the terminal emulator, Gateway packages a useful script language that includes the ability to look for specific screen prompts. What's more, it includes conditional branching, hence the script becomes more of a program than a set of plodding instructions. With these tools you don't have to be a programmer versed in a specific arcane API to automate log-on and program activity sequences. Speaking of APIs, Gateway offers one that is relatively simple, but effective. It is even well explained in the documentation, which is excellent: the manual is full of good information

CABLE INCLUDED Gateway always does an excellent job documenting installation and setup requirements. To make installing the G/SNA Gateway easy, the company even includes the right kind of RS-232C cable. (Since there is a significant difference between the RS-232C cables commonly used for asynchronous modem communications and the cables used for synchronous data lines, getting exactly the right cable is important.) Gateway supports its products with regular training seminars in a dozen U.S. and Canadian cities; the company also offers free unlimited telephone support and free access to a bulletin board service.

IBM PC 3270 Gateway

You would expect IBM to turn out a good bard for SNA communications. It did: IBM's gateway was the only one that finished our testing cycle ahead of schedule, letting us get to bed before sunrise for once. A quintessentially IBM product, the gateway is functional but not frilly. And it has lots of potions.

ONE ON ONE IBM's gateway distributes 32 sessions across the network, but each network station can use only one printer (3287) and one terminal (3278 or 3279) session. While systems from other vendors typically allow multiple gateway connections, each IBM network station can communicate with only one gateway at a time.

The \$240 IBM SDLC Adapter (PiN IS)12030 works on all computers with a PC-type bus. It supports line speeds of up to 19.2 kilobits per second. If you want to use a PS/2 with Micro Channel architecture as a gateway, IBM has an SDLC adapter for those systems, too (PiN 6450348). If you need service at speeds above 19.2 kilobits per second, IBM suggests other architectures, like a direct To-ker-Rine Network connection to a FEP.

The \$475 IBM PC 3270 Emulation Program contains the software for terminal emulation, as well as gateway operation and management. You need a copy for every network station. The terminal emulation program includes application program



interfaces for the 3270 PC API and IBM's Server Requester Program. IBM includes a Trace utility in the gateway software but has few other management options aside from session configuration.

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MAKE BOOM FOR DOS The gateway software loaded on our machine took near-by 300K of RAM, while the terminal emiation software took one 180K. And the software with a software with its TopView windowing prompt because TopView let so you cut and paste and perform other operations between windows, swell as nut programs because TopView let soy ou cut and paste and perform other operations between windows, swell as nut programs different windows. But if you have TopView, terminal emulation, NeBBOS, and the same machine, you won't have a great deal of room for DOS applications.

The documentation for the IBM PC 2770, Version 3.04, is good. A section called "Who You Should Know," which clearly describes the people inside and outside the mainframe computer room you need to talk to before installing a LAN gateway, is particularly enjoyable. The manual also includes worksheets to help you plan the software configuration.

Finally, IBM's gateway is fast: it posted the best throughput figures in several categories of the performance tests. While it is not packed with features, it is easy to set up and use.

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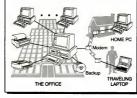
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ICOT CORP ICOT netPATH/A SNA-3270 ICOT netPATH/B

We tested two LAN gateways marketed by ICOT-the netPATH/A SNA-3270 and the netPATH/B SNA-3270. Each of these products evolved from the products originated by a different veteran micro-tomainframe communications vendor, and despite incredibly similar names, they are

vastly different products.

SNA-3270

The main feature of the netPATH/A SNA-3270 Gateway, which was originally marketed by Pathway Design, is its ability to distribute up to 128 LUs to workstations throughout the network. The ability to handle so many LUs is significant: at a maximum of five LUs per workstation, a lot of people can have simultaneous sessions through this gateway.

The netPATH/A's adapter is a half-size board containing an 80188 processor and 256K of on-board memory, with a daughterboard attached. We were able to easily insert the gateway board into a crowded AT in a slot already partially occupied by an Intel Above Board memory card. A nice feature of this board is the ability it gives you to change the I/O and interrupt settings without actually removing the card from the AT. This comes in handy if you have to resolve conflicts between other I/O cards in a crowded AT.

The software for this gateway, the ICOT Network Supervisor, runs on any PC in the network gateway and takes over 300K of RAM. It contains many network management functions, featuring a menu that lets you select between viewing network status messages, displaying statistics, and controlling the connections between various nodes and LUs. The statistics message is particularly useful as a management tool to ensure that resources

are properly used. The gateway software also offers some helpful utilities for you to keep track of your system operation. The Diagnostic Trace facility reports on events on both the SNA communications line and on the Net-BIOS link between workstations and the gateway. It's a nice tool for troubleshooting both sides of the communications system. A Network Logging utility records communications events such as initiation and termination of sessions, aborts, and transmission errors.

The netPATH/A's terminal emulation package can use networked printers and locally attached printers for mainframe-driven print jobs. It takes a minimum of 170K. on each workstation.

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■ STANDALONE LAN GATEWAYS

SIMILAR NAME, NOT MARKET Despite the similarity of the netPATH/B SNA-3270's name to that of its sister, it is a different product that is aimed at a separate market. The netPATH/B has been designed for high performance and to support high-quality graphics on appropriately equipped PCs.

Originally marketed by Integrated Network Systems Inc., which is now a part of ICOT Corp., the netPATH/B SNA-3270 gateway performed well in most of our performance tests, but it could not complete the test requiring it to use high-speed screen buffer dumps to exchange data between the terminal and the host. Although we were unable to test a repaired version, ICOT reports that it has found the bug and fixed it.

ENGLISH ERROR REPORTS This ICOT gateway lacks the management functions of its sister, the netPATH/A SNA-3270, but it does at least report errors in English sentences. Many of the gateway packages we tested reported problems through cryptic numeric codes. This kind of error-message interpretation is particularly important because the software does not include Trace or other network management functions that help to isolate er-

The configuration program for the gateway software is menu driven and easy to use. As with all gateway installation programs, you will need to know a few facts about the 3270 configuration of the mainframe computer. The workstation configuration program is also easy to use, but detailed. You'll also need to know the hardware configuration of every station on the network before you wade into this task.

Once installed, the gateway software occupies a relatively small 200K chunk of the RAM in its host PC. ICOT advertises that this means that the machine acting as a gateway has resources available for other computing purposes, but we suggest that you use care in planning this kind of opera-

tion. The terminal emulation software supports two terminal emulation LUs per station and one printer LU per station. A printer attached to a PC through a parallel port can respond to mainframe print jobs, but the software can't address printers attached to the PC's serial port. It does have an application program interface with good support for screen and keyboard interaction, but it lacks support for IBM's HLLAPI or APPC/LU6.2.

X.25 COMPATIBLE Interestingly, this same software works with another ICOT gateway product that communicates over X.25 packet-switch network connections. It is easy to install both an SNA and an X.25 gateway on the same network. You don't have to reconfigure stations or retrain users to connect to mainframe resources over local and remote communications lines

An optional package for this gateway gives networked PCs equipped with EGA video the ability to display program symbols through IBM 3279 S3G terminal em-

The netPATH/B gateway

software is easy to use;

once installed, it occupies a

relatively small 200K chunk of the RAM in its host PC...

ulation. Program symbols are stored on the host and include characters of different sizes or font style, special symbols, and other features that can be drawn on the screen. The netPATH/B SNA-3270's network interface board is also available in a version for the IBM Micro Channel architecture.

INFORMATION TECHNOLOGIES INC. ITI LinkUp 3270 Remote GateStation

At \$2,995, the LinkUp 3270 Remote GateStation package from ITI is an excellent value. The full-featured, high-performance system even includes a custom keyboard designed to support both 3270 and DOS functions. The company supports its products well and has been awarded several large government contracts.

Featuring an adapter with its own specialized on-board processor and 56K of RAM, LinkUp can be installed in any machine with a PC-style bus and at least 512K of RAM. The gateway can distribute up to 32 LUs to network stations; any single station can take all the LUs, or they can be distributed over a large number of stations.

NO LU POOLING ITI's gateway software doesn't allow pooling of LUs, so it isn't quite as flexible as some gateways that pass out sessions to network PCs on a



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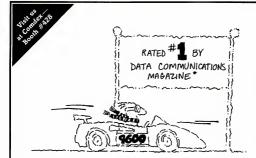
(617) 237-7722 ICOT netPATH/A SNA-3270 List Price: For 8 LUs. \$2.595; for 16 LUs \$3,595; for 32 LUs, \$4,595; for 64 LUs, \$5,595; for 128 LUs, \$6,595. Requires; Gateway station: IBM PC, XT, AT or compatibles: 256K RAM Network

stations: IBM PC, XT, AT, or PS/2: 256K RAM. LAN with NetBIOS s In Short: The netPATH/A SNA-3270 package includes a short SDLC interface card. gateway communications software, terminal emulation software, and good management utilities. Features the ability to distribute many LUs among network stations. CIPCLE 644 CNRFADER SERVICE CARD

ICOT netPATH/B SNA-3270

List Price: With SDLC interface card, gate way software, and terminal emulation software: for 8 LUs, \$1,595; for 16 LUs, \$2,595; for 32 LUs, \$3,595; for 3279 \$3G graphics emulation option, \$395; for host-based file transfer under VM or TSO, \$395 Requires: Gateway station: IBM PC, XT. AT, or compatibles: 256K RAM, LAN with NetRIOS services In Short: The netPATH/B SNA-3270 is a

LAN gateway system with optional S3G video and X.25 gateway services. No frills, but relatively small RAM require



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SDLC adapter card, terminal emulation software for up to 32 stations, one special
DOS/3270 keyboard, INDSFILE and editor-

based file transfer. \$2,995, delational Link-Up \$170 keybourks, \$595 each. Requires: Garrway nation: IBM PC, XT. AT. or compatibles: 117R RAM follows: 40K for first display station, 9K for each additional display station, 9K for the printer, 16K for each additional printer). Network station: IBM PC, XT. AT, or PSP-20K RAM (additional display station, 9K RAM, printer RAM regularizents in per gardinerents in Part and printer RAM regularizents in Part and Part

In Short: A mature gateway system with good terminal emulation, background printing, and strong vendor support. The 122-key keyboard is designed for both DOS and 3270

CIPICLE 647 ON READER SERVICE CARD

first-come first-served basis. The network administrator can, however, reassign LUs from any networked PC with a few keystrokes

The software also includes a Trace utility that helps diagnose and isolate comminications problems. Once the Trace utility is loaded, you can start running the Trace at any time, even when an application is loaded. After the Trace is stopped, you can review the recorded data exchange. In our test-bed LAN, the gateway software took over 207K.

The LinkUp terminal emulation software can make its host PC look like a remore 3286/3287/3289 printer to the mainfinare while simultaneously operating as a 3278/3279 terminal. The software comes with many standard features, including a relatively simple application program interface that simplifies the job of creating log-on scripts and automating other interactive mainframe activities.

Several foreign-language alphabets are also standard, and a character translation table can be easily edited. The software also recognizes a light pen that is some-

times used for special applications. Each workstation must give up almost 94K to the terminal emulation software.

An important function of this gateway system is its ability to accept print jobs from the host computer and run them on standard PC-type printers without disturbing the operation of the PC attached to the printer. The print job can be redirected to a networked printer or to one attached to the gateway machine.

SPECIAL KEYBOARD One LinkUp 3270 keyboard, combining the best features of the early PC AT keyboard and the 3270 keyboard, comes with the Remote GateStation package. It has 122 keys, including special keys for 3270 functions as well as all the keys required for DOS operations: the ten special-function keys are arranged in two vertical columns on the lefthand side where I think they should be; the 24 PF keys are located in two rows along the top like on the 3270 terminal; and there is one Enter key in the usual spot and another under the Right Shift key, where 3270 typists are used to finding it. I didn't like the fact that the CapsLock key is located where Ctrl ought to be, but I was able to remap it. Additional keyboards are \$295

Other options include a package called Laislify Graphics that gives the Potent Address able graphics capabilities of an IBM 3179G display terminal. You can also add a 3270 Remote bob Earry package that allows you to execute RIE batch processing on the same line as \$270 Remote batch processing on the same line as \$270 transactions. The real value of this feature is that it makes it recommitted to the same line are alseased communications. Iline among both types of applications.

III use a mens-driven installation route that requires you to know several things about the communications parameters of the \$270 link. Fortunately, they have defaults that match typical installations. At the time of this review, Linkly, didn't have HLLAFI or APPOLIO.6; interface, but they routed literature structures of the product literature promises that these features are coming soon, if they have the structure of the product literature product literature in the product literature product literature in the product literature in

NAS SBeX-3270

The same product that National Advanced Systems calls the SBcX-3270 is also distributed by Artisoft, AT&T, Alten-Bracley, and SCA, as well as by National Semiconductor Corp., NAS's parent company. While the product lacks some of the features and performance of its competitors, it does have the strength of NAS's worldwide support behind it.

The SBeX-3270 SDLC adapter is a full-size board that fits into the expansion slot of a PC or AT bus system, and, not surprisingly, uses a National Semiconductor 132000 32-bit processor. The card comes in two models, one that operates at speeds of up to 192 killobits per second and another that operates at speeds of up to 56 killobits per second.

The LAN gateway software takes about 184K and includes a simple menu system for software installation and gateway management. The supervisor can closely control the allocation of sessions or allow them to be distributed on a first-come firstserved basis.

The terminal emulation software can run any combination of up to five terminal and/or 3287 printer emulation sessions simultaneously. These emulation sessions can run in the background mode, so that



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tional frills; lacks support for extended color

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Performance Tests: LAN Gateways

These gathway performance lests clearly show that a gathway's software in the key to its speed of performance some cards desided with on-board processing were beaten by simpler devices with better software. Software code differences also contribute to the performance variances in the throughput lests with small and large scale aboves. Other factors influencing throughput include the method adapter coards ability to hardle small data processing influencing throughput include the method adapter coards ability to hardle small data processing influencing throughput include the software contributed to the coard and the software coards and the software

The IBM PC 3270, Version 3.04, walked away with most of the performance trophies. Other products that did consistently well include DCA IRMALAN SDIC Gateway, Attachmate Extral, and Eicon Access/SDLC, as well as the "all-in-one" products from Banyan and Harris discussed in our previous issue.

Keep in mind that the results of the file transfer tests, which appear slow, may not correlat will with the other results because this sals is typically manifed by a separate piece of software, sometimes running in background mode. Also, although we haven't run the same tests using standed fills 327879 terminals, such decident demmals will bypically run much feater than PCs that are emulating terminals. This is simply because the dedicated stemminals use hard-wised opic instead of running programs.

The LAN gateway performance tests use a maintainer software package called (CS270, developed by Innovative Communications, to automatically load and strencise the test-bod's verificiations and gateway, altowing or closes from among a wide variety of lasted and data-loading levels. With the exception of the single-user response lesst, the tests ran without the variations caused by human most.

All tests, accept for the file prander test, shreaded the gateway board and software. LAM interface cache and software, and the 3278 terminal emulation software in the CPB acching as terminal. The different block sizes used in those tests caused valying degrees of efficiency in both the LAM plazeties (or beares) and the 35%-SDLC response units operating as terminals to their limits, and the results dequate to the activities of obtained in inclining in typical operation." Each of the six setts talls under one of two categories throughout a period man feet. The throughout he six flowing feet is set throughout the six flowing feet in throughout the six of the throughout the six of the six of throughout and Termine's behindhams Scoree-fielder Dumy) measure in late per second how quody the gateway can send data that the second six of the sec

accompanying charls.

THE TEST FAIL TO THE LAST gathers; tests were not not LAND connected over 15 to habitipe rescored FAIL 2002 (insect somity to \$100.000 ftm; tests of \$100.0000 ftm; tests of \$100.00000 ftm; tests of \$100.00000 ftm; tests of \$100.00000 ftm; tests of \$100.00000 ftm; tes

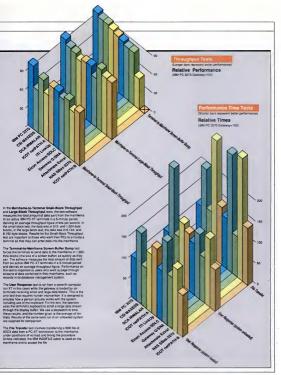
tests in the future.)

Throughput Tests
(Results given in bits per second)

Performance Time Tests (Results given in seconds)

	Mainframe-to- Terminal Small-Block Throughput	Maintrame-to- Terminal Large-Block Throughput	Terminal-to- Maintrame Screen-Buffer Dump	User Response (system loaded)	User Response (system unloaded)	File Transfe	
IBM PC 3270 Gateway	15,613	17,655	15,991	4	2	60	
CSI MAXESS SNA Gateway	10,486	16,420	15,263	8	6	119	
DCA IRMALAN SDLC Gateway	14,093	16,084	15,248	4	2	64	
ICOT netPATH A SNA-3270	11,363	14,964	14,785	6	3	172	
ITI LinkUp 3270 Remote GateStation	14,163	15,771	14,258	7	3	82	
Elcon Access SDLC	14,291	16,027	14,003	5	3	72	
Gateway Communications G/SNA Gateway	13,386	13,671	13,398	9	3	170	
Attachmate Extra!	14,178	17,294	13,393	6	2	58	
NAS 58ex-3270	12,316	16,060	7,733	7	4	177	
ICOT IMPATHE SNA.3270	13.260	15.940	N/A	5	2	82	

*To obtain a more detailed description the procedures and parameters used during the PC Magazine LMN gateway tests, write to knowative Communications inc., P O: 8ox 3590, Framingham MA 0.1701, or phone the company at (508) 875-4821 or (508) 655-4364.



the LAN shared printer—or a printer attached to a PC—can print a mainframe job while the PC is doing other tasks. The software emulates the IBM 3278 and 3279 terminals but does not have extended sevencolor presentation or extended attributes. It occumies about 99K on each workstation.

The documentation includes a lot of information for systems programmers. The terminal emulation software responds to the application program interface that IBM defined for the 3270PC.

In the performance arena, the SBeX-3270 software did not burn up the track. The SBeX representatives present during the test worked with the software, and the times shown on the performance tests represent the best of several runs.

3COM CORP. CSI MAXESS SNA

Gateway
After purchasing CSI this summer, 3Com
Corp., the networking industry giant, decided to scrap the LAN gateway it had
development and instead began actively
marketing the MAXESS SNA Gateway.
With good reason this powerful gateway
offers features-rich software and excellent
documentation.

The nice thing about the CSI MAXESS



product line is that it includes everything you need in one package and at one price. For \$4,995, CSI sells you the gateway card, integrating gateway software, and workstation terminal emulation software that can be copied onto all the network stations.

STOP AND LOOK TWICE CSI's gateway communications hardware contains powerful processing potential; when you notice that the LAN gateway card you are inserting into an expansion solt carriers its own 80286 processor and 512K of RAM, you stop and loot twice. All off that processing horsepower didn't put the MAX-ESS SNA gateway on the top of the performance of the processing horsepower didn't put the MAX-

mance-test charts, but it did finish well. Because the gateway communications card carries its own RAM, the gateway software takes about only 57K in the PC AT hosting the SDLC communications card. This makes it easy to use that machine simultaneously as a gateway and as a network station. However, we recommend that you use this option only if you ensure that no one will turn off, lock up, or reset the sateway machine.

The gateway software features communications management functions that alert users to any problems on the link to the host, and they trace and monitor host sessions for auditing or troubleshooting purposes. The alerts generated by this program can be accepted and used by IBM's NetView network management software.

The MAXESS SNA Gateway lets workstations run both standard 3270 terminal sessions and LU6.2 program-to-program sessions at once. Up to 32 concurrent sessions are supported by the gateway, and all 32 can theoretically be used by one workstation—if it has enough RAM.

The workstation terminal emulation software also includes IBM's High-Level Application Program Interface (HLLAPI). As you'd expect from all of these features, the workstation software occupies over 300K of RAM, but you can easily unload the emulation software if no other memory-resident programs are loaded after it.

HELPFUL HINTS CSI offers five excellent manuals, including HLLAPI and LU6.2 programming guides. All are well written, tabbed, indexed, and full of help-



Attachmate Extra!

This series of reviews proves that the LAN gateway industry is moture and competitive. There are several excellent LAN gateway products to choose from. Your buying choice might be influenced more by the amount of vendor or dealer support you expect to get than by the number of LUS awaitable.

For most installations, you can reach for a product from ITI. IBM. CSI, or DCA with equal confidence. If you want to integrate X.25 services too, you can reach for products from Gateway or Eicon. But if you want both good service and an impressive list of features, pick up the box containing the Extra! 3270 gateway from Attachmote. That vendor's product combines an excellent performance with utilities and frills that end users and programmers can appreciate. The Attachmate Extra! 3270 gateway really is something extra.

ful hints; the sections on troubleshooting are particularly helpful. The on-line help is also clearly written and pertinent to the function being performed.

CSI advertises that the MAXESS SNA Gateway can be installed in 30 minus flowers. However, we believe the claim holds true monly if you have all of the informations parameters at your fingertips. The Gate way Manage typergam is a series of mems that takes you use the step of the state of the

Although the exact relationship between CSI and 3Com is still being hammered out, the addition of the people and resources of 3Com to the support of CSI's products should make any buyer confident that the CSI MAXESS SNA Gateway solution is a smart choice.

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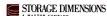
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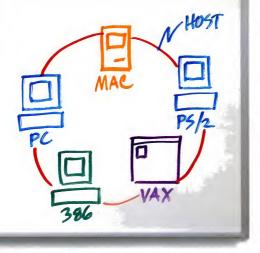
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achieve the highest possible resolution ever in a serial mouse — 400 DPl. And E-Mouse offers you a variety of other performance-enhancing features as well. For example:

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Printing the Perfect Envelope

ometime next century, a histori-

an of American letter writing will

describe the 1980s as the Era of

Technological Incongruity.

S

Throughout the nation, personal and business letters were written on fast computers and printed by the most advanced laser technology that money could buy. The letters often used proportional specing and multiple fosts, and sometimes included graphs and images far too exact to be created by the human hand. And these marvels of technical achievement, produced by a system of printer and computer that often cost more than \$10,000, were mailed in envelopes addressed with a

throwaway ballpoint pen that cost 39 cents.

That same historian may report that the Era of Technological Incongruity came to an abrupt end on the day this issue of PC

123322000

Magazine hit the streets. Everyone who uses Hewlett-Packard's LaserJet printers knows how tricky it is to print an envelope. The printer normally prints text in portrait mode on a page like the one you're reading now, with the lines of text running parallel to the shorter edges of the page. To print an envelope on a LaserJet you have to convince the printer to work in landscape mode, with text parallel to the longer edges of the page. If you cross this hurdle, you have to set new margins, then figure out how to get the printer to switch back to portrait mode when you want to print text again. Most LaserJet users find it easier to keep a typewriter on the desk or a supply of pens in the drawer.

At last, everything you ever wanted to know about getting your HP LaserJet to address and print envelopes.

COMMANDING THE HP LASERJET

If you need to modify some of our macros or if you want to write some printer commands of your own, you'll have to get acquainted with Hewlett-Packard's Printer Command Language. Here's a way to get started.

You can make a LaserJet print by sending it the same raw ASCII text that you send to lesser printers. But to make it sing, you have to learn to speak its language.

its language.

Hewhett-Packard didn't make that an easy task, its PCL, (Printer Command Language) codes rank among the most obscure and arbitrary this side of the wordsfar manual. A few codes have some memorial relation to their meaning, but if you exposed to the properties of the properties. The Leff Margin command ends with L., but the similar-looking command that ends in R sets the number of a vertical Row. The Right Marrin command ends with M.

Application programs normally shield you from the complexities of the HP codes, and you can use most of our mecros without knowing anything about PCL. But if you want to modify these of your own, you'll need a few spare hours and a copy of HP's Technical Reference Manual for the Lassrel HI or the tearler Family Technical Reference Manual of Reference Manual of Sammary of PCL codes spapears in the can give you salt. Lasselete, and this can give you salt.

With a little practice, you can learn to read the syntax of PCL commands even if you don't know exactly what they mean. Each command begins with the

<Esc> character (ASCII 27), followed by either one or two characters, some numerical data, and a final letter. All letters before the end of a command string are lowercase; the printer recognizes the end of the string when it sees a capital letter.

Some macros talk directly to the printer in PCL, rather than relying on an application program or utility to translate. Here's what the commands used in these

"SEG-E" resets the printer to its default margins, page orientation, fonts, and so forth. You should always begin a print job with a Reset command in order to clear out previous commands. And it's good housekoeping to clean up after a print job by issuing another Reset; if you don't, the settings of that print job will remain in effect the next time you send data to the brinter.

"<Esc>&110" sets the page to landscape orientation. You need to issue this command before identifying the font you want to use. "<Esc>&100" sets the page to portrait mode.

If, as in our macros, you follow this command with additional commands that normally begin with "'<Esc>&l", you can use a lowercase "o" rather than a capital "O" and omit the "'<Esc>&l". So our second command, after a Reset, consists of

<Esc>&11o3h6d14E

After the "10" sets the printer in landscape mode, the "3h" tells it to ask for paper from the envelope feed.

The next command, "6d", which sets the line spacing at the printer's default setting of six lines per inch, isn't really needed after an "<5x>E" reset, because the reset restores the defaults anyway. But we've included it so that you can change it for tighter or looser line spacing if you prefer.

Now we come to the delicate task of

page formating. The original Laserlet and Laserlet Plus print an envelope as if it were a rectangular region near the bottom edge of an imaginary 8½- by 11-inch page in land-scape mode. To set a quanter-inch top margin for an envelope, you have to tell the printer to set the margin at around 5 inches from the top edge of the imaginary page—because that's where the top edge of the envelope would be found on the

page.

The Laserlet II can also use the same basic method of formatting envelopes, although you have to set the top margin for envelopes at around 2½ inches from the edge of the imaginary page. The Laserlet II also understands commands that directly set the page size of four different kinds of envelopes, so you can measure the real margins rather than calculate imaginary ones. Our macros waste

EFFORTLESS ADDRESSING Our goal in this issue is to make the job of addressing and printing envelopes as effortless as possible. We've focused on the Lascelet family of printers, but our solutions are easily adaptable to any dor matrix or daisy wheel printer. We've written macros for the major word-processing programs—Microsoft Word. WordPerfect.

DisplayWrite 4. MultiMate Advantage, WordStar Professional, and XyWrite III Plus—macros that will find the address in your letter and print it on an envelope while you sip a cup of coffee.

If you don't use one of the major word processors, you're not out of luck. We've prepared macros for two major keyboardmacro programs that let you print an enve-

lope using an address that any application program puts on screen. We've even written a DOS batch file that lets you print an envelope when you aren't using any application program at all. And we've reviewed its separate programs dedicated to the job of printing envelopes on LaserJets and other printers.

You'll still need a typewriter or a pen to

method required by the original LaserJet

because this makes it easier to modify the macros for any model of the printer.

So, at the end of the "<Esc>&l" string, "14E" sets the top margin (for the LaserJet II) at 14 lines. The capital E ends the command string.

Our next command, "<Esc> &a18L", sets the left margin at column 18. Then "<Esc>(10U" tells the printer to use the IBM PC character set, and "<Esc>(sp10h12vsb3T" is a series of font specifications that make the printer choose its native Courier font. The "sp" (equivalent to "s0p") tells the printer to use a monospace rather than proportional font, "10h" tells it choose a 10-pitch font, "12v" means a font that's 12 points high, "sb" (short for "s0b") calls for a font of "medium" weight rather than thin or bold, and "3T" specifies Courier in particular.

After entering the return address, our macro moves the LaserJet's invisible "cursor" (the position where the next character will print) to the right place to begin entering the recipient's address. The command string is

"<Esc>&a55111R"

The "55!" moves the cursor to a new left margin at column 55, and "11R" moves the cursor vertically to the 11th row below the top margin.

As the macro concludes, its sends a form feed (ASCII 12) to the printer, because the LaserJet won't disgorge a print job until it's told to feed the form-or until you send more lines than will fit on the first page. Finally, we leave everything the way we found it by sending an "<Esc>E" reset.

-Edward Mendelson

fill out multilayered forms, because no one has figured out how to make a laser printer pay attention to the instruction "Press hard-you are making twelve copies." And you may find that a laser-printed address doesn't set the mood for a love letter as well as a handwritten address. But from now on, you'll only handwrite or typewrite your envelopes when you want to.

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Envelope-addressing programs bring macrolanguage convenience to old-fashioned word processors.

any veteran computer users still
prefer their first word processor—the kind that is rife with
dozens of incomprehensible control codes and that disappeared

from the market before the LaserJet was born. Other users prefer to use their spreadsheet program as a word processor. A spreadsheet is enough for memos and reports; very few spreadsheets know how to mint envelopes.

For users like these, a separate envelope program may be the answer. Envelope programs come in two varieties: standalones and pop-ups. You run the standalone programs from the DOS command line after you've exited your other applications. These programs require you to type in the address on a letter, or in some cases they can read addresses from a disk file that contains an address list. Pop-up programs appear on-screen over your word processor or other application and either copy the address from a letter onscreen or let you type an address in a window. Some programs combine both types of operation.

We've reviewed six programs that print envelopes on HP LaserJets. Some work with dot matrix and daisy wheel printers also. And if you use an Epson printer, you may be interested in International Systems Services' \$29.95 Envelope Printer. This standalone program lets you print enve-

lopes in portrait or landscape mode, and it can read addresses from a data file for bulk mailings. Whatever printer you're using, it's time to put the typewriter away.

The Envelope

Please . . .

If you're looking for a simple enveloperinting program with only one tinkly bell and one tuneful whistle, Quaid Software's 339 The Envelope Please: .. is worth considering. It works with dot matrix printers and daisy wheels as well as lasers, and it seems to work best with older printing technology. The program comes out of the box configured for Epson printers, but you can reconfigure if for any of 25 other models, including any Laser-lets.

The Envelope Please . . . only works in resident mode, it pops up when you press and release the Crit key, then Shift, then Alt. This sequence of key is 1 a uniquely intelligent choice because it svin-tually guaranteed not to get in the way of the leystrokes used by any other program. Even if one of your applications uses the Ctrl-Shift-Alt combination, the other program will expect you to press the keys at the same time, and The Envelope and the same time, and The Envelope of And because it intoly uses 146 Kof RAM, it probably won't get in the way of your applications.

The sequence of hotkeys brings up a simple frame, which you can move around



Quaid Software Lad 45 Charles St. East, 3rd floor Toronto, Ontario Canada MeY 152 (416) 961-8243 List Price: \$39 (USS)

Requires: 12K RAM, DOS 2.0 or later.

In Short: A memory-resident address-grabbing envelope programs for all printers: small and simple, with few options. Not copy protocted.

ORCE MOS ON FEADER SERVICE CARD



i have recently been appointed Postmaster of Philadelphia, and wish to introduce extensive reforms into the postal services of the American colonies.

Could you kindly inform me of any innovations in postal services that you or your iffestrious ancestors may have made since your ancestors founded the European postal service three conturies ago?

With apologies with the intrusion on your time,
Your obedient servant,

Benjamin Franklin, Epur.

The Envelope Please . . . has an address-capture screen with an R and an S in the margin, indicating that a return address will be printed on a standard business envelope. The program can print foreign characters in landscape mode.

the screen until it's placed over the address. You can't enter an address into the frame if there isn't one on-screen already. You resize the frame to hug the address by



Please . . . is an excellent choice if you're using a dot matrix

and printing standard 10-pitch type, and for basic printing on a LaserJet.

pressing one of the comer keys on the numeric keypad—Home, PgUp, PgDn, or End. When you press one of these keys, the corresponding corner of the frame can be adjusted with the arrow keys. When the frame exactly surrounds the address, you

press Enter, and the printer prints an envelope. The next time you bring up the frame, the program remembers its previ-

Doc 1 Po 1 Ln 25 Pos 24

ous size and position. The confliguration program lets you choose among a small number of options. With impact printers you can select regular or bold print. If you choose to enter a default return address, the pop-up frame will adways appear with a capital R on both sides, signifying that the return address will be printed. You can omit the return address on individual envelopes by pressing R when the pop-up frame is on-screen.

CHANGING THE DEFAULT The Envelope Flease uses your printer's dealt fort and expects that forts to print out and the control of the co

positions the return address outside the left edge of the envelope. The program is intelligent enough to center the recipient's address between the margins, so you can experiment until you find a setting that will yield the results you need.

The manual claims that The Envelope Please . . . can print foreign characters in landscape orientation, but the review copy couldn't accomplish this feat with a Laserlet, no matter which character set we chose as the printer's default. Quaid Software promises to fix this problem by the time you read this review.

You can choose two envelope sizes, but only the standard business envelope is usable on a Lascetet. The large-envelope option will print 9½- by 12-inch envelopes on an impact printer, but you can't fit that kind of envelope into a laser.

The Envelope Please . . . is an excellent choice if you're using a dot matrix printer and printing standard 10-pitch type. And for basic no-frills envelope printing on a LaserJet, it may be exactly what you need.

ERMAsoft Laser Envelopes

Even an envelope-printing program can have a spit personality. E.R.M. Associates' \$49.95 ERMAsoft Laser Envelopes somehow manages to combine the most flexible, imaginative envelope printing available anywhere with the most confusing, recalcitrant menus and configuration program we've seen in a long time. Fortunately, you only have to run the configuration once, and you can get used to the

After that, ERMAsoft lets you print endepose in any style you like. This program is designed to accomplish only one interpretation of the control of the con



Backing up your data doesn't really take an eternity, it just seems that way.

tnat way. Unless vou have an Irwin mini-

cartridge tape backup system.

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tically store exactly the data you want, whenever you want. Without the hassle of complicated

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All of which may explain why our systems are the hands-down favorite over all others combined.

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■ ENVELOPE PRINTERS

note and don't have time to cut out individual letters from the newspaper, you can switch among four different fonts in the same envelope—even in the same word.

You can also print three different sizes of envelopes and modify any of those sizes to suit your needs. You can adjust the default address position by tiny fractions of an inch—although Laserlets normally blace the address at a slightly different point on the envelope every time they print. And ERMAsoft has different default settings for each member of the Laserlet family and for the Okldata Laserline 6.

EEMAsoft runs only as a standatom program, soit cart pop up over your word processor like its memory-resident rivals and snatch an address directly onto an en-velope. The package includes a small memory-resident address grabed from a word processor, that you have to exit the word processor, that you have to exit it would processor. The grabber occupies as liftle as 3K of RAM, depending on how many addresses you expect to graft.

NO DUMMY When you run ERMAsoft, a dummy envelope appears on-screen, complete with a smiley face on an electronic stamp. You can use or omit a default

hen you run
ERMAsoft,

you can choose up to four different fonts for each envelope.

return address, type in a different return address, or change the default. You then type in the recipient's address, but you have to be careful when editing. If you repeatedly cursor up to a preceding line and then press Enter the return to the line helew, the program will think you're finished typing the envelope and proceed to the print ment before you're ready. Apparently ERMAsoft thinks you're through typing.



The address on this ERMAsoft-printed envelope uses four different fonts. Each one is represented on-screen by a color keyed to the font name listed on the font menu.

the address when you have pressed Enter a certain number of times, and doesn't check to see whether you've reached the bottom of the address field.

If you've specified eartridge and soft fonts when configuring the program, you can choose up to four different fouts for each envelope. While typing or editing, you can change fonts by pressing an Altkey combination that corresponds to one of the forts listed in a pop-up menu. Use this feature with restraint if you want your correspondents to take you seriously.

When you've finished printing an envelope, you can print another just like it or change the return address, the recipient's address, or both.

SPLIT PERSONALITY ERMAsoft's envelope-printing menus are relatively easy to navigate. But the configuration pream is a combination of maze and nightname. It will work if you keep banging keps, but the keys listed on the mornal out 'to dwhat they're supposed to do. I never did figure out how to change the default fout without starting over.

Laserle envelope—one that lets you use the 10-point Palatino Bold font for the return address, 12-point Helvetica Light for the addressee, and 18-point Blippo for the addressee, and 18-point Blippo for EIP code—ERMAsoft Laser Envelopes is the only way to get it. And, of course, ER-MAsoft also prints envelopes in Courier, if you're feeling businesslike.



One of the most important reasons for buying our new LaserJet IID printer is on the other side of this page.

One of the most important reasons for buying our new LaserJet IID printer is on the other side of this page.



The latest member of the HP LaserJet printer family prints on both sides of the paper. But that's just the icing on the cake.

The LaserJet IID printer is full of new ideas for making paperhandling easier and more

An envelope feeder accessory for one. Instead of having to feed envelopes manually, our new printer does it automatically

You wanted more paper trays. So the LaserJet IID printer has two of them, each with a 200-sheet capacity. Give us more fonts, you said. And LaserJet

Series II compatibility. Done! So now you have a choice of two HP LaserJet printers. Both with that superb quality for text and graphics you've come to expect from Hewlett-Packard. All good reasons to call 1-800-752-0900, Ext. 297A for the name of your nearest dealer.



KEEPING YOUR LASERJET WELL FED

Does your wrist ache from handfeeding envelopes into your Laser-Jet? Use a special envelope tray that lets you feed a sheaf of envelopes automatically.

For the LaserJet Series II, Hewlett-Packard offers an \$89 Envelope Tray that holds fifteen envelopes at a time. When you pull out the standard paper tray and plug in the Envelope Tray, the printer automatically recognizes the size of the envelope in the tray.

To use the envelope tray effectively you'll need software that supports it. The vendors of most major word processors will supply printer drivers for the Envelope Tray on request.

For many small businesses the Envelope Tray is just the ticket, but larger businesses will prefer the \$350 Envelope Feeder for the LaserJet Series II. This holds 50 envelopes and allows you to print letters and envelopes alternately without standing over the printer and feeding envelopes or switching trays. —Edward Mendelson



Grab Plus, The Envelope Printer

Don't tell the author of Grab Plus, The Envelope Printer that the competition charges more than twice as much as he does for envelope-addressing programs, and they don't even include all of the same features. He might get ideas.

ZPAY Payroll Systems' \$15 memoryresident envelope program doesn't let you use a different font for each number in the ZIP code, but it knows how envelopes ought to look, and it can print them on virtually any printer. ZPAY even offers a special version that prints PostScript-based envelopes—a feat no other program even attemots.

The offware includes a nonresident database program that less you store addresstes to be grabbed by Grab Plas. You can tag each address with one of the different markers and use all the addresses tagged with a marker for a bulk mailing. The database imports comma-delimited ASCII files from any other database. A single keystroke can rearrange address fields at print time to put a personal name before or after a corporate address.



WINDOW ADDRESSING Grab Pilu cocupies a moderate 36k RAM. When you pop it up over your word processor, it puts a movable window on-screen for capturing the address. You move the window with the arrow keys and resize it with function keys. You can also cdit the address, type in an address if you aren't grabbing one from a letter, and add a comment that will print in the lower-left corner of the envelope. A keystroke lets you choose be-velope. A keystroke lets you choose be-



When using Grab Plus, you move the address window with arrow keys and resize it with function keys. With one keystroke, you can choose between large and small envelopes or between two return

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tween large and small envelopes or between two return addresses stored in a configuration file. You can't type in a third, temporary return address while using the program, but you probably don't

The configuration program lets you adjust the location of the address on large and small envelopes and add printer and font



Envelope Printer

is a RAM-resident program that knows how envelopes ought to look, and it can print them on virtually any printer.

initialization strings. LaserJet and Cordata laser printer initialization strings are already built in.

Because Grab Plus is shareware, you can download a copy from a local BBS and see whether you like it. If you decide to keep it, just pop it up to your screen, grab the author's address from the documentation file, print out an envelope, and send him your check.

Laser, Jet Setup Utility

The only thing wrong with Guy Gallo's LaserJet Setup Utility is that it doesn't fully support the LaserJet II. With any model LaserJet, this program can set margins, pitch, spacing, fonts, and other features, if you're using an application that can't control laser printers on its own or if you simply want to copy a text file to the printer. You can run LaserJet Setup Utility from the DOS command line or pop it up over an application, and every LaserJet owner will find a use for it. But unless you're willing to patch your copy of the program-and we'll certainly lell you how-you can only use it to address and print envelopes on the original LaserJet or



When Laserlet Setup Utility's menus refer to labels, the program means envelopes. This screen pops up when you want to edit an envelope, and the program keeps the same envelope in memory for future use. You can also save the return address or a whole envelope to a file.

the LaserJet Plus printers.

Even if you can't use all its features, this is a program worth having. The price, by definition, is exactly right. The author, Guy Gallo, asks you to download the program from a BBS or get it from a disk library and, if you decide to use it, to "send payment in an amount commensurate with its utility."

We found plenty of utility in LaserJet Setup Utility. Anyone who has ever sent text files to a Laserlet has been frustrated by the wasted paper that results when a printer that starts a new page every 60 lines meets a text file with a page break every 66 lines. LaserJet Setup Utility has a command that makes the printer squeeze those 66 lines to fit on a single page.

SWITCHABLE FONTS The program includes commands to switch among the LaserJet's internal Courier fonts and the more-popular cartridge fonts, and you can store a custom command to switch to any other font or feature that the printer can supply. The program will print a brief font sample on command, so you can make

sure you're using the right font before printing a 100-page file.

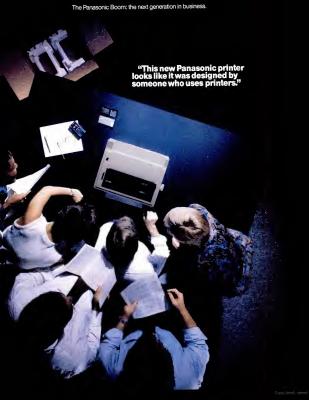
For envelope printing, LaserJet Setup Utility pops up a window with room for a return address and a recipient's address. You can save your return address in a file and import it when needed. You have to name the file when you import it, so you can store different addresses in different files.



LaserJet Setup Utility, Version 4.4 Guy Gallo P.O. Box 344

Piermont, NY 10968 List Price: Shareware (voluntary contribution) Requires: 128K RAM, DOS 2.0 or later. In Short: A valuable control program for La-

serJets, with cavelope printing. It can be used as a TSR but doesn't grab addresses from the een. Not copy prote CITICLE 987 ON REA



Introducing the Panasonic 1124 24-Pin Printer. Designed by the people Selectable on the

who'll use it. Before we designed the 1124, we talked to customers to find out what features they wanted. And created a printer specially designed for nonsoftware experts. The EZ Set™ Operator Panel allows you to make choices simply and quickly-without having to program any software. This printer puts you in command. And puts the commands at your fingertips.

The ergonomically-designed EZ Set Operator Panel presents you with all the features you use most. There's even a special Macro feature that allows you to easily recall all the panel settings for three different formats at the press of a button.

Set" Operator Panel:

- Fonts: 1 Draft and 5 Letter quality
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- Lines per Inch: 3, 4, 6, 75, 8, 12
- Margins: Left and right
- Quiet Mode: Cuts printer noise by 50%
- ■3 Macros
- Function Mode
- Perforation Cut
- Memo Load ■ And more



Panel puts over 20 features at your fingertipsnot inside the cabinet.

Put the printer wherever it's most convenient. The 1124 accepts paper from either the rear, the bottom or the front.

Where you put the printer, and where you want the printer, can now be one and the same location. Whether you'll be using single sheets, continuous fanfold, or envelopes,

By flipping open the front panel, you can feed single sheets-either lengthwise or sideways-from the front. Most other printers require you to change your software program for sideways printing. And with an optional automatic cut sheet feeder, you can even feed single sheets through the top.

Fanfold paper can be fed from either the rear, the bottom or front of the machine. Without snaking over, under or around the cables. And a special Perforation Cut feature lets you tear of sheets at the perf, yet still begin the next sheet within 1/3" from the topautomatically.

When you're running fanfold—but need to print a single sheet or envelope



in a hurry-the Memo Load feature lets you do it without removing or wasting the fanfold paper.

And Micro Line Feed lets you position your pre-printed forms just where you want them.

The 1124 lets you present your ideas with sharp letter quality and crisp, clear graphics. The 1124 gives you five letter quality fonts-standard. Draft Pica

And two draft quality, And by combining the fonts, the character sizes and the enhancement modes you have 5500 valid type style combinations right at your fingertips.

And you can do even more. Because the 1124 uses 360 x360 dots per inch bitmapped graphics to produce special printed effects-every-

Draft Elite Courier Pica Prestige Elite Rold Proportional Space Sans Serif Pica Script Pica

thing from company logos to line art and photo-like images. Everything's sharp. Crisply defined. In both draft modeat up to 192 characters per second-and letter quality modeat up to 63 characters per second.

THO-YEAR LIMITED WARRA PANASONIC PRINTERS AND ACCESSORIES

This new "Push-Pull" tractor makes the 1124 incredibly simple to load.

t's not an finary tractor. Or standard tion feed. And not a cumberne add-on. Instead, this new

flexible design incor-

porates the best features of both feed types. Because it's adjustable, you can easily load paper from the front, bottom, or rear, in Pull mode, continuous fanfold paper feeds from the bottom or front. In Push mode, fanfold feeds from the rear.

In addition, Push mode

allows you to tear continuous forms cleanly. without skipping a form just to advance to the next one. And this new

push/pull tractor and friction feed

system makes it easier than ever to print non-standard paper sizes, like mailing labels, envelopes, multi-part forms, etc.

Two of the 1124's best features, however, can't be found on the EZ Set" Operator Panel: Terrific value. And a 2-year warranty.

The 1124 is a full-featured 24pin printer. Compatible with the rich software libraries supporting the Epson*LQ-2500 and IBM* Proprinter™X24

But the 1124 features a 9-

pin price. Plus something you'll find on very few printers out there: a twoyear warranty* on both parts and labor from Panasonic

That makes it a good investment. With excellent investment protection.

The Panasonic 1124 24-Pin Printer. In today's business environment, it's the printer that makes the most sense.

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The Panasonic 1124 24-pin printer.

Print Method:

Impact Serial Dot Matrix

Print Head and Life:

24 pin (0.2mm wire diameter) 100 million characters (draft)

Print Direction:

Bidirectional (user selectable Unidirectional) Logic Seeking

Print Speed (Matrix):

(Characters per second):

<u>Draft</u>

Eitle— 192 cps 63 cps
Pica— 160 cps 53 cps

Letter Quality Fonts:

Courier, Prestige, Bold PS, Script, Sans Serif

LQ Character Cell Matrix:

24x30

Printing Sizes: 5, 6, 7,5, 8,5, 10, 12, 17, & 20 characters per inch

Characters Per Line: 40, 48, 60, 68, 80, 96, 120, 137 & 160 characters

per inch

96 ASCII characters; 96 Italic ASCII characters 32 Regular and 32 Italic International characters International characters—13 countries. 159 IBM Special characters—Sets 1 & 2

Bit image (matrix):

360 x 360 dots per inch

EZ Set™Operator Panel:

Controls over 20 functions including: Fort Lines Per Inch Pitch Cuiet Mode Form Length Perforation Cut Paper Loading Margin Settings Micro Line Feed Default Setting

Line Feed Time:

Approx. 100 msec (with 1/6-inch line feeding)

Tractor Feed:

User selectable push or pull, swivel mount, flat belt

Paper Feed: Path Method

Front Friction or Pull Tractor Rear Push Tractor (adjustable) Bottom Pull Tractor (adjustable) Top Cut Sheet Feeder (optional) Paper Specifications:

Continuous: 4.0 to 10.0 inches, 14 to 24 lbs. Single Sheet: 4.0 to 11.7 inches, 14 to 24 lbs.

Envelopes: #10
Copies: Original and 3 non-carbon copies
Thickness: Maximum thickness less than

0.013 inches

Emulations: Epson* LQ-2500, IBM* Proprinter™ X24

Interface: Centroni

Centronics parallel, RS-232C serial (optional)

Buffer:

6K (standard); additional 32K (optional)

.....

Noise Level (LQ mode): 56 dBA (standard mode), 53 dBA (quiet mode)

Environment:

Operating: 50° F to 95° F at 30 to 80% humidity Storage: -4° F to 140° F at 10 to 90% humidity

Reliability:

4,000 hours MTBF

Warranty: Limited 2 Years—Parts and Labor

Dimensions and Weight:

16.9(w) x 14.1(d) x 5.6(h) inches; 18.7 lbs.

Options:
Automatic Single Bin Cut Sheet Feeder (KX-P36)
RS-232C with Current Loop Serial Interface
(KX-P19)

32K Expansion Buffer Chip (KX-P43)

Epson is a trademark of Seko Epson Corporation IBM is a registered trademark, and Propinitor is a trademark of International Business Machines Corporation.



Although the envelope will print in the right position only for the original Laser-lets, confident users can patch the program to adjust the position for the Laserlet II. (Make a backup copy first.) Use any file-patching program like The Norton Utilities or DEBUG, search for the two occurrences of the string "27E" in the file, and change them to "14E". Now your copy is customized for the Laserlet II.

Lasertet Setup Utility can print a file from disk using the settings chosen from its menus. It also includes a notepad where you can create or edit one-page text files. This is a miniature word processor complete with commands for line spacing and underlined; talk; or bold text, and it holds your text in memory if you go out to the main program menu to set forth.

Maybe Guy Gallo's pay-what-it'sworth pricing policy for LaserJet Setup Utility isn't such a good idea after all. The more I use this program, the more expensive it gets.

LazrJet Envelope Program

Some programs can do only one thing, and if that's the thing you want done, you don't have to look further. Delta Data Systems' \$19.95 LazzIet Envelope Program prints I aser let envelopes—no more, no less.

The disk comes with two executable files: ENV.EXE for the original Laserlet and Laserlet Plus, ENV2.EXE for the Laserlet II. Each program takes up 162K on disk. Choose the one you need, wait a few



The Lazzbet Envelope Program seems to have olarming ideas about the future of American postal rates. While averting your eyes from the dollar signs, you fill in the return address and recipient's address in the appropriate fields.

seconds while it loads, read the explantory opening screen, then press a lexphop program now displays the outline of an extreopen, and you can fill in the return address and recipient's address. If you don't war a return address, posse first or a few times to get past it. Because you can't store a default return address, businesses with printed stationery will find this program more useful than individuals who pub blank envelopes at the local store and have to type in the return address each time.

When you reach the last line on the address screen, the program displays a handy diagram that tells you what you might not know: where to put the envelope, and which end goes into the printer first. You may get tired of seeing it after a few days, but a Laserlet novice will find it useful.

Once you've printed the envelope, you can press a key corresponding to the kind of tray you're using on the Laserlet, and the letter prints. You then return to the envelope screen to type in another address—and perhaps to make alterations to the envelope you just printed. Until you reach the screen with the printer diagram, you can break out by pressing the Esc key. In the last screen, however, you have to remember to press

Alt-C if you want to quit.

Only one thing about this program has me worried. In the envelope screen, the postage stamp is represented by a box containing four dollar signs. What does Delta Data Systems know that 1 don't know about upcoming changes in postal rates?

NVelope

NVelope comes with myriad menus that ofter just about any envelope-printing option you can imagine. I couldn't find an option to make the printer imitate my handwriting instead of using a font, but it may be lurking somewhere in a submenu I haven't discovered yet.

Paul Mace Software's \$49 envelope processor works either as a standalone program that you run from the DOS prompt or as a memory-resident pop-up. In its TSR mode, it seizes control over a whopping 97K of RAM.

NYelope is versatile enough to work





You can choose from a few dozen different envelope sizes in Paul Mace Software's NVelope, but you'll always have to cursor down to "Sideways Print" to print a standard envelope with a Lawr let.

with almost any printer. But, although it remembers which printer you use, it won't let you change the program defaults to match the way you're most likely to use that printer. Every time you want to print an envelope on the Laserlet, you have to move the cursor to the Sideways option on the Print menu. This seems a needless and

noyance in an otherwise powerful and effective program.

DATABASE OF ZIP CODES NVelope fills your screen with a diagram of an envelope and lets you type in an address or grab one from an application. You can use a default return address or, if you're on the move a lot, type in a temporary substitute. Any recipient's name and address that you put on an envelope can be added to an address list and reused later. If you don't know the recipient's ZIP code, just leave the cursor on the last line of the address, press a key, and let NVelope supply the ZIP from its database. If you use the ZIP code data files that come with the package-one file per state-you can find the correct code for any town that has only one zone; for large cities you get only the first ZIP code that would appear in an official directory. Mace intends to offer full ZIP code databases that will let the program identify the code from the street address.

Once you have begun to compile an NVelope address list, you can use the program for bulk mailing. Call up the list and

tag as many names as you like, or let the program print them all. NVelope will print the addresses on a stack of envelopes or on sheets of labels.

NVelope's Size menu offers 32 different envelope sizes and 16 layouts for labels—including name tags and three-byfive cards, options that you'll probably choose with impact printers rather than Laserlets. The program remembers the envelope size you used last and will continue to use it until you choose another.

MVelope's default hotkey is Alt-Gray Plus, and you can only replace this with Ctrl-Gray Plus, Alt- or Ctrl-Gray Minus, Ctrl-5 (on the number ped or top 1000), or Ctrl-1 (on the top 1000). While his range of choices is probably large enough to avoid most conflicts, some word processors use all those keys for their own functions. One of NVelona's smore obscure menus

is called Control Printer. The manual doesn't explain that the numbers next to Horizontal and Vertical refer to characters and lines per inch. You can open a window and replace the command strings that the program sends to the printer, although you can't edit existing strings. The manual doesn't explain that you enter the crucial Esc character by typing "T". If you understand LaserJet font codes, you can make the program use soft or cartridge



files that come with NVelope—one file per state—you can find the

correct code for any town that has only one zone.

fonts. You can even edit the codes to make the Print option give you landscape rather than portrait mode. But you'll still have to choose either Print or Sideways Print from the Print menu every time—a needless flaw in a powerful program.







Working with Word Processors

Ready-made macros

add new smarts

processors.

he major word processors are robust, feature-laden programs that simplify most of the mechanics of text preparation. But if there's one undertaking that gives pause

even to experienced word processor users. it's figuring out how to get these programs to address and print envelopes. To simplify matters, we've prepared envelopeprinting macros for the market leaders among word processing programs and for the programs that ranked as Editor's to the major word Choices in our word processing blockbuster issue (February 29, 1988)-six pro-

> grams in all. These two categories overlap: Microsoft Word and WordPerfect are both market leaders and Editor's Choices. Each proved its worth by making it easy to write a macro that finds the address and prints an envelope in landscape mode. WordPerfect, Version 5.0-the newest release-includes a basic envelope-printing macro that you can use as an alternative to ours. The other three market leaders, Display-Write 4, MultiMate Advantage II, and WordStar Professional, made matters more difficult. Each forced us to write macros that are less powerful and flexible than our Word and WordPerfect creations.

> Of the remaining Editor's Choices, Xy-Write III Plus presented the greatest technical challenge. In typical XyWrite style. we solved the problem by using direct control over the printer instead of working

through the menus and built-in conveniences provided by similar programs.

The other two Editor's-Choice word processors. Nota Bene and O&A Write. both have envelope-printing functions built right in.

ALL THE ANSWERS Nota Bene's designers seem to have thought of everything. If there's any job a word processor might conceivably do, Dragonfly Software's \$495 XyWrite-based powerhouse probably has a menu offering a half-dozen ways of doing it.

When you want Nota Bene to print an envelope, simply place the cursor anywhere in the address, then press F1 for the menu system, P for Print, and E for Envelope. Nota Bene then presents a screen with nine options. You can use businessor personal-size envelopes or enter the measurements for a nonstandard size. And on each size, you can automatically include your business return address, home address, or no return address at all. Nota Bene prints envelopes in landscape mode with Hewlett-Packard Laserlets and most PostScript printers.

O&A Write's claim to fame is its exceptional ease of use. Symantec Corp.'s \$199 program makes you press a lot of keystrokes to print an envelope on a LaserJet, but every step is on the menu, and Q&A Write finds the address for you automatically.

To print envelopes with a LaserJet using Q&A Write, you have to install the "LaserJet (Envelope)" or "LaserJet II (Envelope)" printer driver in addition to your standard driver. When you're ready to print, you go to the print menu, choose the Envelope option that is listed under Line Spacing, switch to the printer number that you used when you installed the Envelope driver, and print. You'll have to change these settings back to your normal settings before printing the letter itself.

All this takes about a dozen keystrokes, and Q&A Write makes it easy to store them in a macro. Just press Shift-F2, choose the Define Macro option from the menu, press the key on which you want to store the macro, and enter the keystrokes that print the envelope and restore the standard settings. Press Shift-F2 when you're done, and save the macros to disk.

PC MAGAZINE . DECEMBER 13, 1988

LETTING DOS DO IT

Old Faithful can match any macro or word processor at addressing envelopes on a LaserJet.

Vou don't need a macro—or even a word processing program—to address envelopes on your Laserlet. A simple DOS batch file, ENVELOPE BAT (see Figure A), will do the trick in seconds, provided you first create a couple of "emplate" files (Figures B and C) with the codes that make the Laserlet print in landscape mode and set the correct margins. You only have to create the temolate files only.

To use this set of files, type ENVE-LOPE at the DOS command line and then, when prompted, type in the recipient's address. DOS only let styo end to the backspacing over your errors, and you can only edit the line on which you're typing at the moment. You can't go back to the preceding line, although you can break out and start the process overs. When you finish typing the addity press Fo and Enter, and collect your envelooe from the Laest'et.

READY, GET SET, TYPE Type the three files on the next page using any text editor or word processor that produces pure ASCII files. DOS purists can even use EDLIN. Modify TEMPLATE-AAA, which is shown in Figure B, to print your return address on the lines where you want it to appear, or omit the return address entirely.

Wherever the two TEMPLATE files have "C-SCAIL" 27" (the Escape character), hold down the Alk key and type 27 on the number peal. Depending on the editor you use, you will be a left-point agrow or "I" or "I" or "I" in the text. Use the same method to type "ASCIII 22" (the form-feed character), which "I" or "" "I" in the file. In the two the pear of the

Because the batch file selects the IBM

Learniet II Envelope-Printing Setch File

K. Capacine

1. Insert the envelope in the printer's envelope slot

2. Enter the address below

3. Press To Active typing the address (case line 90)

4. Press Enter

or Press Carl-Break to cases!

Features Section

C. Magazine

Or Magazine

We Stork MT 18016'C

The instructions in our batch file are fed to the screen via the ECHO command. Hidden from the screen is the COPY CON command, which you use when entering the address.

character set for the Laserlet II's native Courier font, you can prin freeign active acters by entering their ASCII numbers to Just press the AHEAy and type the ASCII number on the numeric keypad. You can't do this with the original Laserlet or you'll have to replace "10U" with "8U" in the first line of TEM-PLATE AAA. Also, with the original Laserlet and Laserlet Plus, in the second line of the file replace" 14E" with near the end of the file replace "15I".

with "521".

If you add the full pathnames of the two template files to the batch file, you can use these files regardless of what disk or directory you are currently in. Otherwise, you should be in the directory in

which you keep all three files.

DOS virtuosos will recognize that the
ENVELOPE BAT file shown in Figure
A could be made more elegant by reducing the last three lines to a single line:

copy templata.aas+con+templata.bbb prn

Doing it this way would cut down the number of disk reads and writes needed to complete the batch file, although the time you would save could be measured in milliseconds. And if you tried to break out of this version of the batch file by pressing CtT-Berak, the contents of TEMPLATE. AAA would already be in the printer's memory and would scramble your next print job. Safety is more important than elevance.

-Edward Mendelson

ENVELOPE.BAT

echo off cls echo: echo:

echo LaserJet Series II Envelope-Printing Betch File scho:

echo PC Magezine

echo 1. Insert the envelope in the printer's envelope slot echo 2. Enter the eddress below

echo 3. Press F6 efter typing the eddress (same line OK)

echo 4. Press Enter

echo or Prees Ctrl-Breek to cencel

echo:

copy con env.tmp > nul
copy templete.eee+env.tmp+templete.bbb prn > nul

del env.tmp > nul echo:

Figure A: Rather than use a keyboard macro or a word processing program, you can use this simple DOS batch file, ENVELOPE.BAT, to address envelopes on a LaserJet Series II in seconds.

TEMPLATE.AAA

<ASCII 27>E<ASCII 27>61103h6d14E<ASCII 27>6e18L
<ASCII 27>(100<ASCII 27>(sp10h12veb3T<Enter>

Your eddrese here Enter>
Or here... < Enter>

Cr nere...<Enter>
<Enter>
<Rnter>

<Enter>

<Enter>
<Enter>

Or anywhere down to here<Enter>
<ascii 27>&e55111R

TEMPLATE.BBB

<ASCII 12><ASCII 27>E

Figures B and C: Create these template files in a text editor that lets you include lower ASCII characters like ASCII 27 (the Escape character) and ASCII 12 (the page-break character). Press Einter or Insert a CR/LF pair only where the listing has «Einter». You don't need to enter all the lines in the return address, only as many as you need. PFS:Professional Write, Software Publishing Corp.'s \$199 word processor, has a remarkably easy-to-use envelopeprinting option. At the print options menu, just choose E for envelope instead of the default D for document. With the current version, this option works with LaserJets as well as for other printers.

ABOUT THESE MACROS Our macros are designed to make envelope printing effordress. All you have to do is type them in or download them from PC MagNet. Then, when you're finished typing a letter, you can print an envelope on a Laserlet by pressing one or two keys—and you won't need to retype the address or even mark it as a block.

You don't have a LaserJet? You can still use these macros. Simply omit the commands that tell the LaserJet to print in landscape mode, and modify the margin settings; these macros will make envelope printing equally effortless with dot matrix and daisy wheel printers.

Each macro automatically finds the advers in your letter and then prins a business-size envelope with the address in the flight place. All the macros (except those that have to work within the constraints of DisplayWire 4 and MultiMart Antionsof 1) are also designed to print your return address—or your name above or below a corporate letterhead. You can easily omit the return address when typing the macro, or each macro corresponding to different sentions of the print and t

Our macros are designed to work with each program as it comes out of the box, and with an unmodified Luserlet, Luserlet Plus, or Laserlet II. All the macros use the landscape Courier front that comes with all Laserlets, but you can modify the macros if you prefer a landscape front that you use in the from of a catridge or soft from the trought of the property of t

With minor variations, the macros find the address in your letter by searching for the date and then moving down a couple of lines. If you put the address more than three or four lines below the date, you can add keystrokes that will move the cursor



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SALES					
1.	4,677,774	1 221 1%	4,756,970	2 845 (27)	
Europe	3.720,216	403,500	7,011,520	1144,9%	
Ame	441 443	244,627	1.253,380	117,014	
Not halos	4,111,530	2.446.275	17,511,600	4,170,640	
OPERATING EXPENSES					
Cost of sales	2:01.761	201,013	1821561	\$43.990	
Nilling, growth and administrative	3,546.679	SC1306	6,464,663	1,690,902	
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leavest income	71471	53,574	100371	62.413	
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Net income	2.901,867	667,592	1,564,902	1,204,320	
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"Otherwise IX's and constant. Dark them the regions will be long for K. K. Lee compaths with EA.

K. Lee and the long for the l

down to the proper place. But you may not have to bother, because the macros will still work, although the address may print lower down on the envelope.

If you don't start your letters with the date, leave ou the macro's opening keystrokes that tell it to go to the top of file and search for the date. If you let the macro begin at the point where it starts defining the block in which it stores the address, the macro will still work, but you'll have to move the cursor to the start of the address before running the

The macros expect to find at least two carriage returns after the address. The one exception is MultiMate, which can't search for two carriage returns while defining a block. We've provided two macros for MultiMate: one will work with any three- or four-line address; the other prompts you to mark the end of the address and roses a kee've continue.

Our macros are designed to be used in files that contain a single letter, and they search forward for the date from the top of the file. To use a macro in files that contain series of letters, modify it to search backwards for the date, and invoke the macro immediately after completing each letter in the file.

Before creating any of these macros, type a letter in your word processor and make a dry run through all the keystrokes.

efore creating these macros,

type a letter and make a keystroke dry run.

If anything special about your setup causes problems, you can find and correct it before recording the macro.

When you run these macros, the Laserlet II will display the message "Feed Envelope" (or, with some programs, "Feed Letter") until you insert the envelope in the slot on top of the paper tray. If you insert the envelope before you start, the printer will print it without flashing anything. The original Laserfele and the Laser-

Jet Plus will flash "PE" (Put Envelope) or, with some programs, "PF" alternating with "L" (Put Form and Letter).

With all LaserJet models, insert the envelope face up, with the "stamp end" entering the printer first and the returnaddress end trailing behind.

DisplayWrite 4

DisplayWrite 4, IBM's \$495 word processor, is slow, musclebound, and inconvenient, but it gets the job done reliably. Don't expect an old dog like DisplayWrite 4 to learn any of the fancy tricks that its high-end rivals can perform effortlessly. But DisplayWrite 4 knows one or two things the young dogs might learn if they sat still for a moment or two.

sa sain an antoniana trivou. Until recently, Dupling/Write 4 officially supported any printer you liked—as too be JBM. Finally, without making much noise about it, IBM scanwolfeed that Hewlett-Packard had sold one or two laser printers, and Dzimpliwfire users can now obtain Laserlet printer drivers written by IBM. You'll have to ask your dealer for free copies of the Display/Write views rolling with the printer drivers written by IBM. You'll be seen to see the printer drivers written by IBM. You'll be seen to be supported with, which contains the best supplement "disk, which contains the



drivers, and the "Modification Update 02" disks, which update DisplayWrite 4 so that it can use the drivers. When your dealer says he's never heard of these disks and doesn't know how to get them, tell him you read about them in PC Magazine.

him you read about them in PC Magazine.

Our macro, shown in Figure I, will find
the address in a letter and automatically
print out both the letter and an envelope.
Because DisplayWrite is used almost exclusively by businesses and institutions,

sarch F7=Format F8=Instructions

Ln 27

lns

Typestyle 26



I am writing to complain about the sudden profusion of junk mail that has begun to infest the American postal service. Do our couriers not have better and more urgent missions to

DisplayWrite 4's keystroke programming menu is called up by pressing Ctrl-F1. You can also map a macro to a function key.

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F6 G 999<Enter> Search for page 999 (goes to end of file). «Ctrl-R» Insert required page break after lest page. F7 R A Reset Format to Alternate Format. F6 G 1 Go to top of first page. P6 P Find ... <Space>198 ", 198" to find date. <alt-6>Genter> Remove eny leftover search string; search. Move down to exact of eddrese. F4 C Regin Block Copy. F6 F Pind ... <Ctrl-L><Ctrl-L> Two carriage returns at end of date. <Alt-8><Enter> Remove earlier eearch string; search. Define address in Block F6 G 999<Enter> Go to leet page again. Cinter> Copy address to envelope.

Figure 1: As you type this macro for DisplayWrite 4, press the Enter key only where the listing includes "<Enter>" and the Spacebar where it says "<Space>". When more than one keystroke is listed on a line, press the keystrokes in order, without adding spaces between them."

Peginate, save, and exit.

Print the letter and envelope.

we have not included instructions for a return address. It's possible to include the return address in the macro by including the necessary page layout changes, but this involves a large number of keystrokes.

P2 P

Pointer>cinter>

FIRST THINGS FIRST The first thing to do, if you haven't done it already, is to modify your DisplayWrite profile to work

with these drivers. If you use DisplayWrite mainly for reports and correspondence, you should revise your default System Profile. Otherwise, create a special profile for correspondence, and activate it when needed

When revising or creating a profile, first revise the Defaults for Text. Choose Alternate Format, then go to the Margin/Tab screen and set the margins to 55 and 108 for the LaserJet II (52 and 105 for the original LaserJet or LaserJet Plus).

no doignant Laserier of Laserier Fruss., Then, still under Alternate Format, go to the Page Layout screen and for the Laseriel II, set the first typing line at 26 and the last typing line at 36 for the original between the last typing line at 36 for the original between the last typing line and the footer at my number lower than the last typing line and the footer at my number lower than the last typing line. Now press PgDn for the second page of Page Layout opions, and set paper layout opions.

Now choose Workstation defaults, select options for Printer I (or whichever printer number you use for the Laserlet), and choose Automatic Feed as the paper source. For your printer table, choose HPLASER.PFT for the Laserlet III, or HPLASER.PFT for any others. Finally, save the profile and activate ii.

LET'S MAKE A MACRO Begin by creating a letter. Make sure that you enter the date in the form "October 31, 1988" and then press Enter twice before entering the address. Type the text of your letter. When you are finished and ready to print, create our macro by pressing Ctl-FI to turn on

GET READY FOR LASER-READY ENVELOPES

Envelopes especially designed for laser printers will reduce the incidence of paper jams.

The HP LaserJet can sometimes be a bit too helpful—notably when the heat of the printer seals an envelope so you have to pry it open before inserting a letter. The printer also has a bad habit of wrinkling envelopes, possibly to pay them back for causing paper jams.

You can reduce paper jams by rubbing your fingernail across the leading edge of an envelope before printing it. But you're better off using envelopes that resist jamming by themselves. The Stuart F. Cooper Co. (1565 E. 23rd St., Los Angeles, CA 90011-9989; (800) 421-8703. (800) 821-9292 in Calif.) manu-

factures envelopes especially designed for trouble-free laser printing. Plain 20pound envelopes cost \$32.75 for 500, \$61.00 for 1,000, and \$141.25 for 2,500. Plain 24-pound envelopes cost \$35.50 for 500, \$66.00 for 1,000, and \$152.50 for 2,500.

The fibers on these envelopes run parallel to the edges to help prevent wrinkling; those on standard envelopes run diagonally, and tend to pull to one side or the other in the printer. The Cooper envelopes also use self-seal flaps with a pulloff strip so you won't have to pry open your envelope after you've printed it. For

an additional charge, Cooper will print or engrave its envelopes with inks that won't feather or melt from the heat.

Cooper doesn't elaim that its envelopes will cure all your printing problems. In fact, Cooper sends a variety of pupers for you to Cooper sends a variety of pupers for you to the fore you make a large purchase. The company has a large purchase. The found that some laser printers actually do a better job with standard envelopes. The purchase was the purchase which is the purchase which is the purchase that the purchase was the purchase was the purchase that the purchase was the purchase which was the purchas

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MON-FRI 9-6 SAT 10-4

Keystroke Programming. Select Capture, and type in each of the keystrokes in the left-hand column of our listing. The comments in the right-hand column are for your information only; do not type them into your computer.

When you're through, press Ctrl-Fl to stop recording your keystrokes. Select End Capture, then Save. You can assign the macro to an Alt or Shift state of a function key (as in Alt-Fl) by pressing that key when prompted for the name of the macro, or save the macro under a name like ENV.

While you are saving the macro, the full text of you fetter is energing from the printer. If you have a Lascelt II, the letter will print first, and then the printer will prompt you to insert the envelope. If you have an earlier Lascele, Displat/Write 4 Ceverly prints the pages in reverse order so that they fall into the paper tray in the correct order. That means that you'll be prompted for the envelope first, and then the printer will print the remaining pages.

When you're ready to print another letter, either press the function key to which you've assigned the macro or press Ctrl-F1, choose Recall, and enter the name of the macro. In either case, select Automatic Recall to run the macro and print the letter and envelone.

MODIFICATIONS To debug an existing macro, select Playback Singly instead of Automatic Recall. The next keystroke will be displayed at the top of the screen in sequence, and you have to press Enter to play it back. If you want to insert keystrokes into the macro, press Ctrl-Fl during this playback, choose Capture, type the keystrokes, then press Ctrl-F1 again and select End Capture. To delete a keystroke, press Del instead of Enter. Although DisplayWrite 4 doesn't provide the separate macro editor that other programs have, it lets you modify a macro while it's being performed, when it's easiest to figure out exactly what went wrong.

If you're still using DisplayWrite 3, IBM's LaserJet drivers won't work. But you can buy a full-featured set of DisplayWrite 3 drivers from DLB Software, which will let you print envelopes as easily as you can with DisplayWrite 4. You'll have to use slightly different keystrokes in an envelope macro (in DisplayWrite 3 the Required Page End is on the F8 Instructions menu), but the basic principle is the same. DLB Software is located at 12808 Woodbend Court, Dallas, TX 75243; (214) 238-5945. The drivers range in price from \$75 to \$120, depending on LaserJet model.

Microsoft Word

After letting Word stagger along for 4 years without keyboard macros, Microsoft added a full-featured macro language to Version 4.0 of its \$450 word processor. The wait was worthwhile. Word's macros are easier to write and edit than anyone clee's, and they offer foolproof and lexible ways to print envelopes on a LaserJet or anythine size.

You can create a Word macro in either of two ways. The simplest is to turn on Word's macro recorder by pressing Shiff-E3. Then press the keys you want it to play back later. Press Shift-E3, and give the macro a name when prompted. If you want to assign the macro to as single key combination, type a caret (7 after the name of the macro, then press the Ctrl key and an alphanumeric key, such as M; the macro



will then play back whenever you press Cul-M. Or you can assign the macro to a pair of keys by typing the caret, then Ctrl followed by two letters. Because macros are stored in Word's glossary, you can play back a macro by typing its name into a file and pressing F3, just as you do to insert or-



Force highlight into edit screen.

<esc>Octab 5>t<enter> <ctrl pgup>

Switch to text mode if in graphics (this is for speed, not function). Go to top of file.

<esc>S<space>19??^^w <tabbdcenter>

Search for space, date, white space, Search forward and find date.

<riaht> *IF NOTFORMS Move beyond date to start of address.

«PAUSE Move cursor to stert of address and press Enter»

If search fails, user finds address.

<16>

Extend the selection.

<esc>S^^p^^p<enter><left> <esc>C<enter> <ctrl pgup><ctrl enter>

search for two persgraph markers, and copy the address to the scrap. Top of file; open a new division. Go into new division: insert address.

<un><ins> Cose>U <esc>U

Now delets address, then... undelete so it's highlighted sgain.

Gesc>FDM2.5"<tab 2>1.5"<tab 3>11"

Formst the division, (Original LJ: use 4.7, 1.4, 11.) Indent the highlighted address.

<ctrl pgup) <enter><un>

Go to top of file. Go above address. Go to left margin for return address.

<esc>FF<tab>0<enter> Your name<shift enter> Your street<shift enter> Your city<shift enter> <shift enter><shift enter>

Replace any of these lines with your eddress, or insert return eddress before any ""<shift enter"; don't delete any ""cshift enter"".

<shift enter><shift enter> <shift enter><shift enter><shift enter>

<ctrl pgup><f6> <esc>S^^d<enter>

(enter)

<da1>

Go to top of file, extend selection. Search for division boundary. (See text if using old LaserJet.) Go to print options, find the name of the standard driver,

<esc>POwset PortraitPRD = field=

and substitute a landscape driver (use any landscape driver's name). Choose to print the selection only.

Stab (Decenter) "PAUSE Insert envelope and press Enter-

> Print it! Delete the envelope page.

<esc>PO<PortreitPRD=</pre> Chab Charlester Vesch Restore standard printer driver. restore print option defaults.

Figure 2: Type the text of this Word macro, including the angle brackets and the NAMES of the keys, exactly as shown above Type "<enter>" just as you see it here, complete with angle

brackets. Enter the guillemets (+, +) by pressing Ctrl-[and Ctrl-]. You may press the Enter key at the end of each line to make the macro easier to read and revise.

dinary text into a file from the glossary.

The other way to create a macro is to type it as a document. But you create a special kind of document in which control keys, function keys, and cursor keys are represented by their names, printed between angle brackets like this: <esc>, <enter>, or <ctrl M>. When you're through, select the whole document by pressing Shift-F10, and copy the macro to the glossary. Give it a name the same way you name a macro when you record it.

EDITINGAMACRO To edit an existing macro, start with an empty window and press Esc. then I (for Insert). Enter the

name of the macro, followed by a caret. If you leave out the caret, Word will obediently play back the macro, with results that you may not like. When you're through editing, select the whole macro and copy it back to the glossary.

You can debug a misbehaving macro by pressing Ctrl-F3 to turn on a single-step processing mode. Now when you play back a macro. Word nauses at each keystroke and waits for you to press a key before continuing. When you find out what's going wrong, press Esc to stop playing

back the macro, and then edit it You can create our envelope macro,

document, selecting the entire text, and copying it to the glossary under any name you like. Enter all the text in the left-hand column; ignore everything in the righthand column. While you can press Enter or Shift-Enter immediately after each line in the left column, do not add any spaces or tabs at the end of any of the lines. Enter the guillemets, « and » (or "chevrons," as Word calls them), by typing Ctrl-[and

When you make a test run of these keystrokes, omit everything within guillemets except where the macro restores your original printer driver at the very end. For the shown in Figure 2, by typing it as a Word dry run only, simply type in the name of



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Both Mace Gold and Mace 5 provide support for DOS 4.0, partitions up to 512 Megabytes, and the backing of a company that specializes daily in recovering the unrecoverable.

"Almost all lost data can be retrieved, even from an "invalid drive specification" or worse. My Guide to Data Recovery contains everything Eve learned in the past five years about recovering and repairing lost files, presented in a format that inexperienced people, as well as the technically asture, will find useful. This book will steer you around the obstacles on the road to recovery and down the path to success." — Paul Mace



400 Williamson Way Ashland, OR 97520 To Order: 800-523-0258 or 503-488-2322 your original driver at that point.

All copies of Word 4.0 come with a landscape printer driver for the LaserJet or LaserJet II, called HPLASLAN.PRD, with other landscape drivers for individual font cartridges. Recent copies also have improved drivers for the LaserJet II, with names beginning with H2 instead of HP. Our macro uses HPLASLAN PRD. but when you type the macro you can substitute the landscape driver that corresponds most closely to the LaserJet driver you use for normal printing. If you use landscape soft fonts, or a font cartridge that has landscape fonts, you can include in the macro a command to change to the correct landscape font. Add this command immediately after searching for the division boundary, when the entire envelope is highlighted.

CHOOSING THE RIGHT BIN Although Word's Printer Option screen letsyou select Bins I through 3, you can't use Bin 3 to select the Laserlet's envelope feed, as you can with other programs. If you're using the original Laserlet or the



envelope.

ur Word macro is designed to

perform by itself all the work of formatting an

LaserJet Plus, you will have to hit the manual feed button before inserting the envelope. But you can save yourself the trouble by adding a line to the macro at the point where it says "see text below if using old LaserJet":

<esc>PD{ASCII27}&13H<esc>

This line sends directly to the printer the codes that make it expect to receive paper in the manual feed slot. Where we print {ASCII 27}, simply hold down the Alt key and type 27 on the number pad. This will insert a left-pointing arrow in the text and

send the Escape character to the file. The character after the ampersand is a lower-case I, not the numeral I. Make sure to capitalize the H. (You don't need to bother with this line for the LaserJet II.)

If you want the macro to print the letter itself after printing the envelope, simply add this line at the end:

<esc>p<enter>

Our macro is designed to perform by itself all the work of formatting an envelope. It should work properly in virtually any circumstances, without any change, but if you will be the only person using it, or if all copies of Word in your office use the same formats and spike sheets, you may want to modify the macro so that it uses the glossaty to import your return address and a sylesheet to format the envelope instead of formatting the address and return address ofmenting the address and return address of-

USING STYLE SHEFTS Here's an outline of the procedure for using styles to format the envelope and recipient's address. (The measurements are for the Laserlet II; where the original Laserlet and Laserlet Plus need different measurements, these are given in parentheses.)

are given in particuscies. If you want in particuscies, if you want Word to print a return address, create a division myte that sets the you magin to 2.5 inches (1.4 inches), and the magin to 1.5 inches (1.4 inches), and particularly inches) and the return address, with easily "space after" so that the return divers and the space after total 2 inches. Create a paragraph style for the received. Create a paragraph style for the received address that indensity by 3.5 inches. You can include landscape printer fonts, if available.

One small warning: our macro won't work if the very first text in your document is formatted as hidden text. A word of

thanks is due to contributing editor M. David Stone, who pointed this out and made valuable improvements to our original version

MultiMate Advantage II

It wasn't easy to write a full-featured crope macro for MulliMate Advanage II.

But we finally managed to work acound the advaned selsing, limited functions, and hitherto undiscovered bugs of Astron-Take's \$555 word processor. Our marter's \$550 word processor. Our melosia sai fit were programmed by Rube Goldberg, but it works. And now Multi-Mate users will be able to print out their eletters and envelopes, and have those letters near envelopes, and have those letters researced to their original condition in case then read to be revised later.

Ashton-Tate's tech support normally suggests that you print a Laserlet envelope as a separate document. But if you do that, you can't automate the process, because MutilMate won't let you transfer an address to a template file. You can copy from a letter file on-disk to an envelope file on-screen, but you will have to type



ow MultiMate users will be able

to print out their letters and envelopes, and have those

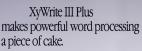
letters restored to their original condition in case they need to be revised.

in the name of the letter every time.

On request, Ashton-Tate will send you a Lascrlet sheet-feeder driver that lets you specify that either the first or the last page of the file will print from the envelope tray. You also insert a font-change code (Alt-C, then a letter representing a landscape font) at the top of the page that includes the text

for the envelope.

To format your envelope, you have to press the Enter key about 25 times, then



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■ ENVELOPE PRINTERS

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Press SPACEBAR to select mode Press F18 when finished, ESC to exit CURSOR MODE DELETE HODE

F1>Gome><F2><F6>,< >198/F18><A1+ F3><4><4><F8><4><4><4><4><4><A1+ F4></F18> Ctrl Pulle>Cf18>CAlt 3>881881u881855823u41.letene(>CF18>Ctrl F?>1CF18>CF18> Del>(Ctrl End>(Del>(Shift F2>(Alt 3>881899y881818886n41jetfs1(>\F18>(Ctrl F7>

ENVFIND is our macro that automatically finds the recipient's address when you are using MultiMate Advantage II. This is how it appears in the program's key-procedure editing utility. Once you bring the cursor into the text of the macro, you must press Ctrl-M to change modes; if you forget to switch from Delete Mode to Cursor Mode, you will probably destroy the macro.

press the Spacebar 50 times to set a new tab stop, and then press the Tab or Indent envelope.

key for each line of the address. To add injury to insult, the printer always spews out a blank page before and after printing the

FACT FILE MultiMate Advantage II, Version 1.0



Ashton-Tate Corp. 20101 Hamilton Ave Torrance, CA 90502 (800) 437-4329 (outside Calif (213) 329-8000

sires: 384K RAM, DOS 2.0 or later. In Short: This slow, awkward, incapable peneram has a bare that keeps complex macrus from working smoothly. Severely limsted formatting and editing functions don't help, either. Not copy protected. DROLE MADER SERVICE CAR

A TALE OF TWO MACROS - We can do better than that. We've written two macros, shown in Figures 3 and 4, that automate envelope printing (without wasting paper) in slightly different ways. Choose

the macro that suits you best. ENVFIND (Figure 3) automatically finds the address and prints an envelope. but only if the address is exactly three or four lines long-as most addresses are. ENVPROMPT (Figure 4) finds the beginning of the address, but promots you to point to the end of it. This works best if you frequently find yourself writing to people whose addresses have widely varying lengths.

All you need to do before you create and run one of our macros (or Key Procedures, as MultiMate calls them) is to copy the Printer Action Table for LaserJet envelopes from the Printer Driver floopy disk that comes with the package. You'll find LJETENV.PAT in the \PRINTERS directory on the disk. Copy it into your Multi-Mate directory and you're ready to type in the macm and use it



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<F1><Rome> Go to top of first page. er2> Insert pege breek.

<F6>, <\$pace>198<F10> Search for date. <A1s-F3>-Down>-Down> Go to beginning of line end two lines down.

-re-Stert to define block for Copy. cDown><Down> Include three more lines CALL-F4> Include ell of fourth line.

Finish defining block. <Ctrl-PqOp> Go to previous page.

Copy the block. <T10> calt-lo Print the document; set options first, 001

Start et pege 001. 001 Stop print after page 001. Dreft mode; no need for enhanced print.

001 Print one copy. Left margin 55 (52 for original LJ, LJ+).

055 023 Top margin 23 (37 for original LJ, LJ+).

Do not double-spece. Defeult pitch (4 = 10 cpi).

liete Printer Action Teble for envelopes; Speceber fills the entire field.

Print the envelope. <F10> <Ctr1-F7> Insert e Stop-or-Continue prompt.

1<F10><F10> Edit the ease document agein. CDel><Ctrl-End> Delete the first peop.

<Shift-F2> Remove the pege breek. GALT-3> Print the document; set options first.

Start at page 001. 001

999 Stop at the last page.

Dreft node OK.

001 Print one copy. 010 Left mergin 10 (edjust to your defeults).

006 Right margin 6 (adjust to your defaulte). Do not double-space.

Default pitch. ljetfal<spacebar> Standard LJ printer driver; use the driver you use normally. Print the text.

ZC+ =1 - 975 Another Continue/Stop prompt.

Figure 3: ENVFIND, one of two macros for MultiMate Advantage listed in the first column only. Do not press Enter anywhere in II, automatically finds the address and prints an envelope, but only the macro. if the address is three or four lines long. Type in the keystrokes

USING YOUR MACRO When you've | finished writing a letter, press Ctrl-F8 to execute a key procedure. Type the name of the key procedure, press F10, and sit back and relax.

Z#10>

The macro goes first to the start of the letter and inserts a page break to create a new blank first page. It then searches for the date above the address by looking for the string ", 198", (This will work until December 31, 1989. With luck, you'll be using a different word processor by 1990.)

The ENVFIND version of the macro then moves down two lines and defines the next four lines as a block. If you have a

and the blank line that follows; if you use a four-line address, it defines the complete address.

The ENVPROMPT version of the macro doesn't define the next four lines, but displays the prompt "Press (C) to continue. Please enter data, then Ctrl-F6 to resume." We didn't write that prompt, by the way; it's built into MultiMate. Press C move the cursor to the end of the address, then press Ctrl-F6, and the macro will pro-

ceed. Both versions of the macro now copy the address to the blank first page, call up the Document Print Options menu (in efthree-line address, it defines the address | fect, by pressing Alt-3), and print the doc- | driver, and prints the text of the letter.

ument on-screen. The macro sets the options so that only the first page prints; it sets the top and left margins to the correct

size for an envelope, and selects the LJET-ENV printer driver. Then it starts printing. At this point a prompt asks you whether

you want to continue or stop. Wait until the envelope finishes printing-don't be impatient or else the macro won't work. Then press C to continue. The macro now calls the same document to the screen, deletes the envelope page, and calls up the Document Print Options screen again. This time, it sets the options for standard page printing, restores your standard printer



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CF1>CRome> Go to top of first page. (F2> Insert page break. <F6>, <Space>198<F10> Search for date. CAlt-F3>CDown>CDown> Go to beginning of line end two lines down. **(T8)** Start to define block for Copy. Insert prompt (MultiMate celle it ''Peuee''). «Ctrl-F6» CF10> Finish defining block. <Ctrl-PgUp> Go to pravioue page. ~10× Copy the block.

dit-3> Print the document; next lines set options. 001 Start at page 001.

001 Stop priot after page 001. Dreft print DK.

001 Print one copy. 055 Left margin S5 (S2 for original LJ, LJ+). 023 Top margin 23 (37 for original LJ, LJ+).

Do not double-space. Default pitch (4 = 10 cpi). Printer Action Table for envelopes.

11ete CF10> Print the envelope. Ctr1-F72 Iosart a Stop-or-Continua prompt. 1-(710)-(710) Edit the same document again.

Chal>Ctrl-End>Chel> Delete the first page. <8h1ft-F2> Remove the page break. <alt-3> Print the document; eet optione firet.

001 Start et page 001. 999 Stop at the last page.

Draft mode DK. 001 Print one copy.

010 Left margin 10 (adjust to your defaulte). 006 Right mergin 6 (adjust to your defaulte). Do not double-space.

Defeult pitch.

ljetfel<spacebar> Standard LJ printer driver; wee your normal driver. CF10> Print the text.

<Ctr1-F7> Another Continue/Stop prompt.

Flaure 4: ENVPROMPT, also a MultiMate macro, finds the beginning of the address. but asks you to point to the end of it. Type in the keystrokes listed in the first column only. Do not press Enter anywhere in the macro.

At the very end of the macro, we've included another prompt that asks whether you want to continue or stop. This time you want to stop. The prompt is included only because if it isn't there, a nasty bug in MultiMate tends to cause loose keystrokes to be played back as the macro ends, so that MultiMate beeps, acts unpredictably. and generally fouls things up.

To record our macros, you should create a new document, type in a date and address, and then press Ctrl-F5 to build a key procedure. Type in the name of the macro and press F10. Then enter the keystrokes in the listing. When you finish, press Ctrl-F5 again. When you create the ENVFIND macro, the envelope will print out with the address. If, however, you type in the keystrokes that create ENVPROMPT, the macro will print a single character on the envelope instead of an address-but when you play back the macro later, it will work correctly.

A MADDENING MACRO EDITOR If you make a mistake while entering the macro, prepare for a frustrating session with MultiMate's macro editor. From the Utilities menu, choose the Key Procedure Files Utility, then choose Edit an Old File

and select the macro you want to fix. To move around the file, select Cursor Mode. When you reach the point where you want to make a change, press Ctrl-M

to choose Delete or Insert Mode, then press F10, and delete or insert keystrokes. Each mode only lets you delete or insert-you can't move around the file without pressing Ctrl-M again, choosing Cursor Mode, and then pressing F10. It's a lot easier if you get the macro right the first time.

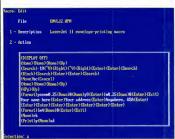
WordPerfect

If you have a LaserJet and any version of WordPerfect earlier than 5.0, order the upgrade before 5 P.M. today. No other program makes laser printing as effortless and trouble-free as WordPerfect Corp.'s \$495 printshop-I mean word processor.

WordPerfect knows all about envelopes, and it knows exactly where to print an envelope on both the original LaserJet and the LaserJet II. This is one of the few macros discussed in this article that doesn't require different measurements for different printers.

WordPerfect 5.0 includes a powerful and complex programming language for its macros in addition to the easy-to-use recorded macros of earlier versions. To use the full macro language, you have to use the built-in macro editor, but the manual's description of the macro language will make sense only if you've had some programming experience. The MAC-





Our WordPerfect macro is shown here as it appears in the program's macro editor. WordPerfect automatically adds the "(Display Off)" instruction to a macro that your record at the keyboard, or you can add it from a menu of instructions that appears when you press Cirl-PgUp.

RO.KBD file supplied with WordPerfect includes an all-purpose newlope macro that uses the programming language but doesn't produce perfect results with a Lasetlet. Our LaserJet-specific macro, to contrast, can be recorded directly from the keyboard by anyone, and it produces perfect results. A more complex version of our macro, using the resources of the sitvanced macro language, may be found on PC MagNet.

BEFORE YOU BEGIN If you have the original Laserfer or Laserlet Plus, you should do one thing before using this macro. Go to the Print-Select-Edit-Forms menu, and with the highlight on "Enverse to "Initially present." Then exit by present to "Initially present." Then exit by present or "Initially present." Then exit by the present of the deliverse of the present of

ing a LaserJet II, you have a very early version of the program. Call WordPerfect Corp. for an updated copy.

You can record our macro, shown in Figure 5, by pressing Cris-Flou and giving the macro a name and description. If you name it something like Crita. Et, you can invoke it later by pressing Cris-E. Or you can name it "ENV" and invoke it by pressing Alt-Flo and entering ENV. Or you can attack it to a key on a keyboard layout that you create using the Keyboard command on the Setum menu.

Record the macro by pressing the keystrokes listed in the left column in Figure 5. Only press <Enter> where the macro specifically instructs you to do so. When you're done, press Carl-F10 to turn off macro recording.

If you make a mistake or two, you can use the built-in macro editor to correct them, and you won't need any programming experience. Press Ctrl-F10 and then enter the name of the macro that you want to edit. WordPerfect asks if you want to edit or replace it. Type E to bring up the editine screen: two A to enter that screen.

and then make your corrections carefully.

Press Ctrl-F10 to toggle to a keystroke recording mode within the editor.

Because WordPerfect selects fonts intelligently, this macro will use the available landscape font that most closely resembles your default portrait font. You can also add an explicit font selection command to the macro.

RELIABLE DATE-SEARCHING The macro searches for the date by locking for a space, followed by "19"; followed by any two characters and then two hard returns. WordPerfect's wildcard is a Curl-X, which you enter by typing first Curl-X, which you enter by typing first Curl-X, which prompted for a "key." WordPerfect copies the address to we page, prints the page, and then deletes it. On a fast machine you may not not have anything has happened until your envelope sides out of the Lacerlet.

If you want the macro to print the letter after printing the envelope, simply add these keystrokes at the end:

<Shift_F7>F

To make the date-searching part of this macro more reliable, we go to the top of the file and search forward. But if you're certain that the body text of your letters won't ever contain a date followed imme-



the envelope, add a few

keystrokes to the macro.

diately (with no punctuation) by two carriage returns, you can modify be macro to search backwards from the end. This way, you can write a series of letters in one file, print out the envelope for each letter when you fe finished writing it, and then print all the letters at one time when you ir finished with the file. Even with the present form of the macro, you can perform the same trick by adding each new letter at the start of the file.

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Clome>-Clome>-Clome>-Clp> -Clr1-Enter>-Clp> -Chift-FibPREE

NO.25-Cown-0-Cown-P9-Cinter LNO.25-Cown-0-Cinter-CF7> Your name here-Cinter> You address-Cinter> Anyplace, USA-Cinter>

Gnter>Gnter>Gnter>Gnter>

<Shift-F8>IM4-Down>0-Enter><F7>

CCtrl-F4088 CShift-F7>F CCtrl-F40ad Go to top of file, before all codes.
Search for date (using wildcards).
Note initial space in this line.
Start the search.
Start the search.
Start defining the address.
Search for two [BRt] codes.

Copy the defined block.
Don't copy the block with <Enter>,
Back to the top of the file.
Start a new page, move into it.

Format Page Size Envelope.

Vertical margins; no page numbering.

Left and right margins; back to file.

Modify to suit your needs; but

don't delete any Chter>.

Left margin for receiver's address. Retrieve the block. Print the envelope page. Delete the envelope page.

Figure 5: As you record this macro for WordPerfect, Version 5.0, press the Enter key only where the listing has "<Enters".

WordStar Professional

Dear Word-Processing-Advice Person, A lot of programs suddenly seem to be advertised as "professional" word processors. Am I a pitiful amateur if I don't use one of them?

-Puzzled in Peoria

Dear Puzzled,

A "professional" word processor is one that is harder to use than the competition and accomplishes less. The vendor calls it "professional" in order to make its unfortunate customers feel better. They may have to remember obscure and illogical commands, but at least they can be proud of the difficulty of it all.

-The Word-Processing-Advice Person

WordStar Professional includes a macro feature called "Shorthand." Shorthand obeast 1 do much, it seems designed to make you wish it weren't there at all. You can't simply record your keystrokes. Instead you write them down, then enter them into a lift window. Every time you want to enter a control code, you have to press CrIt-Pfras, something you will be intably forget. You can't debug macros by playing them back in single-stee most

The Shorthand feature is all too appropriately named. Each macro is limited to about 50 characters. If you want to do something complicated like printing a letter, you'll have to chain macros. When you take WordStar Professional out of the box, you've limited to a total of 500 characters in all your macros, but you can expand this miserly amount through the

Your hard-working programmer wasn'thward by all these obstacles, and if you're willing to type in some macros very carefully, you too can print envelope automatically on your Laserlet. You don't even have to use WSCHANGE to get beyond the default 500 characters, although you may have to remove the sample macross that come with the envorant.

First, at the DOS prompt, enter the following command in every directory in which you expect to store letters:

<shift-F7>F

WSCHANGE program.

This will create a zero-length file called ENV.TMP that won't take up any space on disk. Our envelope macro, shown in Figure 6, writes a file called ENV.TMP to disk, and expects the answer Yes to a

prompt that asks if this file should be overwritten. If you already have this filename in the directory, the macro will work smoothly. You only have to do this step once.

If you haven't defined a sheet feeder for your LaserJet, go into WINSTALL and do



San Rafael, CA 94903 (800) 227-5609 (outside Calif.) (415) 499-1200 List Price: 5495 Requires: 844K RAM (512K for Advanced Page Preview feature), two floppy disk

Page Preview feature), two floppy disk drives, DOS 2.0 or later. In Short: Champy formatting, printing, and macros make envelope addressing a complex task in Release 4. Bugs in Release 5 pot in the way of our macros, but even if the program worked, its marcos would still be awkward to write and use. Not copy protected. DRUGE BROWNERS SHORE CAND

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■ ENVELOPE PRINTERS



This WordStar Professional Shorthand screen is entirely devoted to the four linked macros that make up our envelope macro, but there's room for other macros as well. To enter a control character, press Ctrl-P first, then the character.

so now. You and I both know that you don't really have a sheet feeder, but the different slots on a LaserJet work the same way sheet feeders do, and the envelope slot is the equivalent of bin 3.

TAKE THE PLUNGE Now take a deep breath and go into WordStar. The following instructions apply to WordStar Professional, Release 4.0, and the LaserJet II: they are followed by a description of the

Env Macro 1

minor adjustments you'll have to make to work with the original LaserJet and Laser-Jet Plus, and the more difficult adjustments you'll have to make for Release 5.0.

Bring up the Shorthand menu by pressing Esc, then press? to edit or create new macro definitions. Begin by typing E, then name the macro "Env Macro i" and type in the codes until the screen looks like the chart in Figure 6. Keep in mind that to type a control character like "O, you must first type Ctrl-P, then Ctrl-O. Similarly, the Esc character is entered by typing Ctrl-P. then Esc; it appears on-screen as '[.

Macro E ends by running the second macro, F, which starts G, which runs H. which runs I. Each of these macros is entered the same way you entered Macro E.

The macro sequence starts by going to the top of the file and searching for the date in the form

"<space>19??<return><return>"

The question mark chosen at the Search Options menu makes the "??" in the search string function serve as wildcards.

The macro then marks the address as a block, goes to the top of the file, enters the format for a landscape page, types the return address, enters a new printer offset for the receiver's address, copies the address, and turns on the block once again. It zips back to the too of file, saves the marked block as a file named ENV.TMP, and deletes the block. ENV. TMP is then printed, and the cursor returns to the letter

WordStar experts will notice in Macro F an apparently excess ".pa" command that looks as if it will print out an unwanted blank page. Don't omit that command. Unless Release 4.0 receives the sequence of dot commands ".bn 3", then ".op", then ".pa", the command to use bin 3 (the manual envelope feed) won't have any effect. The extra ".pa" doesn't eject a page. but simply makes the ".bn 3" command do what you might expect it to do anyway. Don't try to find this secret in the manual. Use your name and address in macro G or, if you want it to appear under a printed address, in macro H. Don't delete any 'M characters, which represent the Enter key. but insert your return address between the existing 'M characters.

For the original LaserJet or LaserJet Plus, use ".mt 27" instead of ".mt 13" in

Macro F.

NEW COMPLICATIONS WordStor Professional, Release 5.0-at least the early copy that we received shortly before press time-is a lot trickier to work with. Although we followed the instructions of MicroPro's laser experts down to the last dot command, more than half of our attempts to print an envelope using the enve-

```
TOFTOF 19221NTNTNTNTNTXTXTKBTOFTNTNTMTMTKkTOFTIF
,bn 3°M.op°M.pa°M.pr or=L°M.mt 13°M.po 16°M°|q
Env Macro 5
^Kc^Of^N^N^M^M^Kk^Or^Kb^KwEnv,tmp^Mv^Kv^KpnEnv,tmp^l^Oc
```

Figure 6: This is how the completed Shorthand screen for WordStar Professional, Release 4.0, should look. This macro works with the LaserJet Series II; two simple adjustments to Macro F will allow it to work with older LaserJet models. To ent character like Ctrl-Q, press Ctrl-P, then Ctrl-Q. To enter *[, press Ctrl-P, then Esc.

Princeton's UltraSync. The clear winner!



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66...the UltraSync has the edge in brightness and sharpness over the (NEC) MultiSync, making its text easier to read . . . the Ultra-Sync's sharp display topped the fuzzy (IBM) 8513 display hands down . . . display image is as sharp as a stiletto and as bright as an arc lamp...Even as the brightness is turned up. . the characters displayed on the.. screen remain clear and sharp... excellent video qualities. 99

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When it comes to high-resolution autosynchronous color monitors that are IBM PC. PS/2. Apple Mac II and SE Series com-

patible, the experts point to UltraSync. Why? UltraSync's brilliant color display and superb high-resolution, for starters. Also because UltraSync offers extensive graphics standards ** compatibility due to its wide autosynchronizing frequency ranges. It adjusts automatically to practically any standard. Then there's Ultra-Sync's automatic picture sizing. Built-in text switch. Ergonomic design. And its affordable price (\$849).

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■ ENVELOPE PRINTERS

```
    Kow Macro 1
    "Qu'ng 1999m's Mehamir arbangememmembrangem(e
    Kow Macro 2
    pp on-VM.mat 15-M.po 16-M.op*Mm(g
    Kow Macro 3
    Tow Macro 3
    Tow March 40 arbane 40 arbane 40
    Kow Macro 4
    Tow Macro 4
```

Figure 7: This macro for WordStar Professional, Release 5.0, and the LaserJet Series II doesn't explicitly use the bin 3 command. If you put an envelope in the slot before running the macro, the LaserJet II will print the envelope even though the macro doesn't tell the printer to use the envelope feed.

^Kc^Qf^H^M^Kk^Qr^Kb^KwEnv.tmp^My^Ky^KppEnv.tmp^K

lope feed caused WordStar to crash with a "Divide Overflow" message. Shortly before we went to press, we were told that MicroPro had a programmer working on the problem.

Meanwhile, by ignoring MicroPro's instructions and sample files, we devised a macro, shown in Figure 7, that lets the Laserlet II print an envelope—athbough it doesn't explicitly use the bin 3 command. If you put a nevelope in the stot before running the macro, the Laserlet II will print the envelope even though the macro doesn't tell the printer to use the envelope feed.

The original LaserJet and LaserJet Plus need an explicit manual-feed command before they will accept envelopes, so this Release 5.0 macro won't work with those printers. MicroPro's recommended settings for the initial dot commands on an original-LaserJet envelope are as follows:

```
.mt 41
.mb g
.op
.bn3
Recipient's address
Anywhere USA
```

.pr or=L .pl 51 .po 56

.pa

If your copy of Release 5.0 consistently prints this file without crashing, you can incorporate similar settings into a macro like ours. To include the return address, first set the top margin to 31 and the printer offset to 10, then leave eight lines for the

return address, and change the offset to 50 for the recipient's address. Maybe you'll get lucky. We didn't.

XvWrite III Plus

XyWrite III Plus is a raw and powerful engine that you can shape into a subtle and exact instrument. XyQuest's 5445 word processor includes an extremely powerful macro and programming language that can also be extremely obscure to anyone who doesn't have programming experience. And XyWrite doesn't let you record a macro while you perform the actions you want to play back. But XyWrite does offer you a wide variety of ways to address envelopes.

On request, XyQuest will supply a small, effective XyWrite program that automatically prints out an envelope on a Leac'tell. The program requires some interaction between itself and your standard printer driver, and you have to insert a font code into the program before you first use it You also have to keep a template file original to the control of the control o

LESS ELEGANT, MORE INSPIRED Our macro is less elegant, but it finds the address for you, doesn't need a template file, and doesn't pay any attention to the printer driver you use. We've written it to use the Courier foot that comes with the LaserJet, but you can modify the font identification codes to work with any portrait cartridge foot or soft front.

The ingenious part of our macro, shown in Figure 8, is that it doesn't use XyWrite's printing functions at all. It simply writes out all the codes and text needed to print the envelope, defines them as a

Shown here is our XyWrite III Plus macro as it appears in the program's expanded mode. The twoletter bold codes are keyboard function codes, entered from the command line with "PFUN BC". The European autotation marks. or willmens, are entered with Crti-< and Crti->.

■ ENVELOPE PRINTERS

(F3) Cencel env existing define. BC on 1 (Enter) (BC = F5) Turn off error beep. (Ctrl-Some) Go to top of file. Next line searches for date and two CRs. (WE = Shift-Alt M) BC se \ 19MN WN <Ctrl-Enter>\<Enter> Make sure Scroll Lock is ON before pressing Ctrl-Enter! «ifeers»«glBednews»«si» If not found, exit. (CD = down arrow) Cursor below dete. (F1) Turn on define. Next line searchee for two CRs. BC se \<Ctrl-Enter><Ctrl-Enter><Ctrl-Enter>\<Enter> Make sure Scroll Lock is ON before preceing Ctrl-Enter! If not found, exit. eifeerwseglBadneweseeis (CU = up errow) (F1) Block-define eddress. RF (Ctrl-End) Go to end of file. x&x<Enter> Insert marker to find leter. <Eec>E<Eec>41103h6d14E<Esc>4e18L Insert Lassofet format codes; for 4sech press Esc kay. For original LJ and LJv use "280" and "150". <Eec>(10U<Esc>(spl0h12vsb3T<Enter> Insert font ID code; original LJ and LJ+ use "(80", not "(100". Your name here Enter> Modify return eddress here; you Your etreet address<Enter> may remove any unneeded «Enter>s. Your city, USA<Enter> (Fotor)(Enter)(Enter) cPatarac Patarac Patara <Eec>6e55111R Original LJ and LJ+ use "'521", not "'551". CP XD (F7) Copy address. (F3) Clear define. <Enter><ASCII 12> Send formfeed (use Shift-Alt 12 for ASCII 12). eranar. Reset printer. BC seba \x4x\<Enter> Go back to the marker. CR CR CR CR (CR = Right arrow) Go into envelope. DF DF DF (F1) (Ctrl-End) (F1) defines envelope. BC append prn<Enter> Copy the defined block to printer. BC on Octobers Turn error beep back on. (Alt-P6) Delete defined block. BC seba \x4x\<Enter> Find marker.

(F1) (Ctrl-End) (F1) Define marker. (Alt-F6) Delete marker.

If address not found, say so

(F5) (F10) End macro, clear command line.

Figure 8: This macro for XyWrite III Plus doesn't use the word processor's printing functions at all. Instead, it simply writes out all the codes and text needed to print the envelope, defines them as a block, and appends that block to a file called "PRN." Type this listing in expanded mode. The boldface two-letter sequences (always followed by a space) represent keyboard functions. They

are entered by going to the command line and entering PFUN XX (some copies of XyWrite also use PFUNC XX), or by pressing ScrollLock to turn on the recording function. Press the Enter key only where the listing has <Enter>; press Ctrl-Enter and the Esc key where the listing has "<Ctrl-Enter>" and "<Esc>". Enter the guillemets («, ») by pressing Ctrl-< and Ctrl->.

block, and then appends that block to a file | called "PRN." PRN is DOS's name for your printer (you can use COM1 instead if your printer is attached to the serial port), and XvWrite treats it like a file. XvWrite thinks it is adding the text of the envelope to a file on-disk-but the result is a perfectly printed envelope on paper. Some versions of XyWrite III Plus will beep and display the message "Error writing to disk," but the macro will work exactly as it should. The macro given here has one safety feature: it won't print the envelope if it | Ctrl-F9 to switch to expanded mode.

DF BF DF

BC CC eev-

«lbBadnewexBC es 0<Enter>

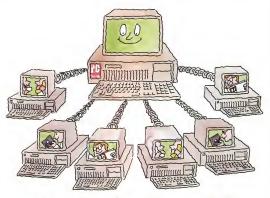
BC CC opr Address not found >

version of this macro, with more-elaborate error checking, is posted on PC MagNet. GETTING STARTED The first sten in creating a XyWrite macro is to open a pro-

can't find the address. A more advanced

gram file with the NEP command. If you want to call the macro ENVELOPE, enter NEP ENVELOPE on XyWrite's command line. Our macro uses the guillemets («, >>) in which XvWrite keeps its programming and formatting codes, and which are invisible in the normal display mode. Press

A XyWrite macro consists of function codes and ordinary text. Function codes represent the actions performed by individual keys. A XyWrite program represents the F5 key with a boldfaced "BC" followed by a space; this stands for Blank Command line. Unlike the situation when recording macros in Word and WordPerfect, you can only record these keystrokes "blindly" by inserting the codes into a separate program file; you can't immediately see what the effect of the keystroke would be if you entered it while working on a normal document



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(Note: After you have become a member, you can locate a local stelephone access number, or 2400 bps service, by typing GO PHONES at the 1 prompt.)

2. When you progres a Connect or Carrier.

Detected message, enter Cri-C.
3.1 At the BOST MAME prompt, enter CIS.
5.20 4 at the USER ID prompt, enter CIS.
5.00.
5.00.
5.00 5.00 prompt, enter Crivation of the Crivation o

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You cannot enter a XyWrite function code by directly typing the letters BC in boldface in the text. Instead, you use one of two methods. First, you can record the separation of the control of the strend probe of the strend probe of the strend papers in the text. If you make a make, it is not a first probe of the strend professing 57s the BC code then appears in the text. If you make a mistake, turn off ScrollLock before trying to correct it; otherwise you'll only record the keystrakes that you try to use to correct

the error, but the error itself will remain.

Alternatively, you can enter the BC code into the program by going to the command line and entering PFUN BC (do not turn ScrollLock on when doing this). This results in fewer errors, but both methods should yield the same outcome.

You want your completed macro to look something like the left column of our listing, although your screen will have line breaks only where the listing has <enter>. The boldfaced codes represent keyboard function codes, the guillemets contain programming commands, and everything else is text that you can type in as you normally do. Where the listing says <enter>, press Enter, and you should see a left-pointing arrow; instead of <ctrl enter>, you should see a reverse-video ring: instead of <Esc>, a right-pointing triangle; and instead of <ASCII 12>, the female symbol. To create the guillemets type Ctrl-< and Ctrl->.

When you're finished, store the program. After writing a letter, you can print the envelope by going to the command line



Xyllhute

Version 3,53 XyQuest Inc. 44 Manning Rd. Billerica, MA 01821 (508) 671-0888 List Price: 5445 Requires: 384K RAM,

DOS 2.0 or later.

In Short: You need nerve and practice to write a complex macro in XyWrite, but the result can be extraordinarily powerful. It's a rough-edged program with enormous potential for growth. Not copy protected.

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and entering RUN ENVELOPE.

If you want to attach the macro to a key like Alt-E, so that you can run it with one combination keystroke, add this line to STARTUP.INT: BC ldpm envelope, e<enter>

The XyWrite manual has further suggestions for attaching a macro to any other key.



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board macro programs—programs lite RoseSoft's Prokey—can do tricks like automating keystrokes and cutting and passing text from the screen. A newer generation performs its magic on the printer as well.

Here for the typing are two keyboard macro programs that make your printer do more of the work for you. What could be smarter than that? We've written envelope macros for two of today's most advanced keyboard macro programs, Keyworkz and Lotas Metro. Each macro uses a viriation on the same technique. Both prompt you to block off an address that appears on the screen, and then they automatically insert the address within formatting codes and send the whole thing to the printer. Our Keyworks macro stores the formation and offer macro stores the formation and offer macro stores the formation and offer macro stores them on-disk. The result is the same.

Most of the dedicated envelope-addressing programs reviewed in this issue can also capture an address from the screen and print it on an envelope. But a keyboard macro program lets you do a few hundred other things in addition.

Keyworks

About the only thing a Keyworks macro can't do is flip the big red switch that turns your computer on. We've found exactly one keyboard macro program that has more functions than Alpha Software

Corp.'s \$99 package—and that's Alpha Software's \$299 Kryworks Advanced Version. The advanced version is designed for users with a little programming experience and a lot of time, but the basic Kryworks program is designed for anyone who can hang on a keyboard. Any marcro written for the basic Kryworks will also work with the advanced version.

You run our envelope-printing Keyworks macro with your letter onscreen. The macro prompts you to mark the comers of the address on your letter, copies the address from the screen, and prints it on an envelope. You create the macro itself by loading Keyworks into memory, pressing the menu key (the default is gray Plus), choosing Edit Macros, and then typing our listing into the editing window exactly as it appears, except of course for the substitution of your own return address anywhere in the space provided. You can press Enter where the lines break in the listing. Immediately before the first "{Printer1}" code, you can add the keystrokes that will make your word processor return to the top of the document, if you like, so that the address will appear on-screen. In WordStar, for example, you could include "{CtlQ}R"

We've provided two different listings, thoose the right one for the Laserlet thooled that you use. The macro for the Laserlet Series II is shown in Figure 9; that for the original Laserlet and Laserlet Plus is shown in Figure 10. We've attached the macro to Ctrl-E, but you can choose any key you like. You can also invoke the mac-





Alpha Software Corp. One North Ave. Burlington, MA 01803 (617) 229-2924 List Price: \$99 Requires: 128K RAM, DOS 2.0 or later.

In Short: One of the most advanced and function-rich keyboard macro programs available, with flexible and effective printe support. Not copy protected.

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(Enter)+ (27)8e55111R(Printer1)+

(CutPaste)(100)(Printer1)(Expand)(100,12,27)E(Printer1) ((CtiF) (Briginal LaserJet Envelope Macro) (Printer1)+

(27)E(27)41103h6428E(27)4a15L(27)4k16(27)(8U(27)(sp10h12vsb3T+ four mane here (Enter)+

our address here(Enter). City, State USA(Enter).

Buit But Bopy Missert Find Beplace Expand Esyntax Keyworks macros can be created or edited in the program's built-in editor, which includes basic word processing functions. Everything between the "{Printer1}" codes is sent to the LaserJet.

ro from Keyworks' List Macros menu. Ex- 1 pert users can create a menu that will list this and other macros without attaching each macro to a separate key.

HOW TO BEGIN Start this macro with the text of your letter on-screen. The macthat format the envelope and the text with your return address. A message then asks you to block off the text to be pasted into the macro. You move the cursor to one corner of the block, hit B, move the cursor to the opposite corner, and hit Enter.

internal "numeric macro" that isn't nor-

```
Keyworks copies the blocked text as an
ro begins by sending the printer the codes
([Ct1E]<LaserJet II Envelope Macro>[Printerl]
 {27}E(27)&11o3h6d14E(27)&a18L(27)&k1G(27)(10U(27)(ap10h12vab3T
 Your name here(Enter)
```

Figure 9: Create this file for the LaserJet Series II in the Keyworks macro editor. Type the curly braces exactly as they appear; press Enter at the end of each line. You do not need to include all the {Enter}s that appear on their own lines, only those you need to position your return address correctly.

(CutPaste) (100) (Printerl) (Expand) (100, 12, 27)E(Printerl)

GETTING PERSONAL

After making some minor modifications. vou can use our macros with envelopes designed for personal correspondence.

A ll of our macros and template files are designed for standard business envelopes measuring 91/2 by 41/s inches. If you want to create macros for the 61/2- by 31/4-inch envelopes used for personal correspondence, you should change some of the LaserJet control codes. With a LaserJet II, for the return address, replace the "18L" left margin setting with "46L"; for the left margin and row number for the recipient's address, replace "55111R" with "65110R". With the original LaserJet or LaserJet Plus, leave the returnaddress setting unchanged and for the recipient's address use "62L10R".

set margins in inches, you'll have to experiment to find the best results. For the left margin of the return address, try adding about 3 inches to the setting for a business envelope, and for the recipient's address add 2 inches. -Fdward Mendelson

With word-processor macros that

mally run from the keyboard (we've given it the arbitrary number of 100, but you can use anything from 10 up to 255). It then "expands," or plays back, this numeric macro to the printer, and finally sends the codes to finish and print the envelope.

When Keyworks copies text from the screen, it normally inserts a carriage return character (ASCII 13) at the end of each line, instead of the usual carriage-return line-feed pair (ASCII 13, ASCII 10). When working with Keyworks interactively, you can tell it to put the CRLF pair at

Jingle bells, crunch those cells,

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assembler)

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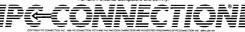
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Figure 10: To create this Keyworks macro for the original LaserJet or the LaserJet Plus, follow the same instructions that were provided with Figure 9.

the end of each line, but in a hands-off macro that copies text to the printer, you need a different technique. The Laserlet commands in this macro include one unique command: "<es>\lor \lambda in \text{in} is tells the Laserlet to translate the carriagereturn character into a CRLF pair, printing the out-and-pasted text on separate lines.

Although it's beyond the scope of this article, Keyworks Advanced Version lets you write a macro that automatically finds the address. If you use Keyworks Advanced Version with a word processor or a database program that always displays an



can write a macro that finds the address.

address in exactly the same place onscreen, create a macro that goes to a specified line and cursor position and starts importing lines until it encounters a line that begins with blank spaces. If the address will appear at different places on-screen depending on the kind of letter you're writing, then you have to use more complicatdet tests and branchings, and you may be better off letting your word processor print the envelope directly. key—Alt-E, for example. Press Alt-E while you have a letter on your screen, and the macro will perform the following commands. (We've capitalized the words that correspond to menu items on Metro's accessories, and you can compare these letters with those in the listing.)

the macro first calls up Merro's Clipboard and Ersses anything it might can be considered to the considered to the contain. It one tells the Clipboard Cliptonian it of the considered to the condisappears and a prompt appears at the upof the secren; it tells you to move the cursor to the start of the recipient's address and press F7 to start defining a block, then move the cursor to the opposite corner and press F8 to start defining a block, then move the cursor to the opposite corner and press F8 to a fact defining a force.

The macro now pauses for you to enter your keystrokes; this pause is represented by "{LineIn}" in the listing. When you press Enter, Metro copies the address into the Clipboard, chooses the Format Normal d setting that inserts a carriage return linefeed at the end of each line, Quits, and

calls up the Editor accessory.

In the Editor, the macro issues the File
Retrieve command and calls up a template
file, ENVELOPE.FIL (shown in Figure
12), with the codes that set up the LaserJet

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You can assign our Metro macro, MAIN.KSM (shown in Figure 11), to any

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Shown here is Lotus Metro's Editor accessory, with the template file that our macro uses for formatting an envelope and printing the return address. The macro uses Metro's Clipboard accessory to capture the recipient's address and insert it at the end of the template file.

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ENVELOPE PRINTERS

MAIN.KSM

(Accd) (F10)e(F10)ct(TEXT; 76; 1; Cursor to start of address, press F7, to end of address, press End and Enter) (LineIn) (Return) (F10) fn(F10) q(AccE) (F10) fr D:\METRO\ENVELOPE.FIL(Return)(CtlEnd)(F10)p(F10)fp (F10)nv(Eec)E(F10)fsprn(Return)(F10)q

Figure 11: Type this file in Metro's Editor accessory. Do not press Enter at the end of any line; the line breaks will be slightly different in the actual editing window. It you use a different drive or directory for Metro, modify the pathname included in capitals in line 4.

to print an envelope with your return address. The macro presses Ctrl-End (to go to the end of the file) and Pastes the recipient's address into the template file. Then the File Print command prints the envelope.

PORTRAIT RESTORATION Now that we've printed the envelope in landscape mode, we need to send a Reset command to the LaserJet to restore its default portrait mode. Otherwise, the next letter you print may come out in landscape.

Here's where our macro gets very clever. We can't use Metro's Editor to print a file that contains only the "< Fsc> E" Reset command because Metro always sends a form-feed to the printer at the end of a file, and this would cause the printer to eject a blank page. Instead, the macro creates a New file (after answering Yes to a prompt that asks if it's all right to lose the changes we made to the template file). It types "<Esc>E" into the file and uses the File Save command to write the file under the name PRN-a command that tricks Metro into sending the file to the printer itself. Metro obediently displays a message saving that it's saving the file as PRN in the current directory, but DOS sends the file to the printer. The macro then Exits from the Editor, and the LaserJet prints your letter.

As with our Keyworks macro, you can refine our Metro macro to include the keystrokes that will make your word processor return to the top of the file, so you can be certain the address will be on-screen when you need it. WordStar users, for example. could add "{CtlO}R" to the beginning of the listing. If you want to avoid using a template file with the LaserJet codes and your return address, you can include in the macro itself all the keystrokes that create the template file in the Editor accessory. However, it's faster to use the senarate template file.

There are two ways to create this macro, by recording the keystrokes or by typing in the text. Whichever you choose, first call up the Editor accessory by pressing Shift-Alt-E and create the ENVEL-OPE.FIL listing shown in Figure 12. Store the file in your \MFTRO directory. Now you can create the macro itself.

If you create it by recording keystrokes. start with a letter on-screen and call up the Macro accessory by pressing Shift-Alt-M. If you've already created macros, move the cursor to the first blank line Press I for Learn, press the key to which you want to attach the macro, and enter a brief descrip-



In Short: Metro's keyboard macros would be powerful even with out its separate ac sory programs, but the combination offers a uniquely flexible package. It's not as effective at handline a printer as Keyworks. though. Not copy protected.

tion. Where the listing has "{AccD}" and "{AccE}", press Shift-Alt-D and Shift-Alt-E. Omit the string that begins "{TEXT" and ends "and Enter}". Where you see "{LineIn}", press Alt-1, then move the cursor to the start of the address, press F7, move it to the end of the address. and press End, followed by Alt-1.

When you finish recording keystrokes, press Shift-Alt-M again. You will see the text of your macro, with "{LineIn}" in place of the keystrokes from Alt-I through Alt-1. Edit the text to include the string beginning "{TEXT" and ending "and Enter}", as shown in the listing. Press F10. select Index by pressing Enter, press F10 again, and Quit.

Edward Mendelson is a contributing editor of PC Magazine.

ENVELOPE.FIL

<Esc>E<Esc>61103h6d14E<Esc>6s18L<Esc>(10U<Esc>(sp10h12vsb3T<Enter>

Your name hereckness

Your address(Fater) <Enter> (Enter>

(Enter> (Enter)

<Enter> Anywhere down to here Enter>

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Figure 12: Create this file for the LaserJet Series II in the Metro Editor accessory. Modity the return address as needed. Press the Esc key where the listing reads "<Esc>"; press the Enter key where the listing reads "<Enter>". You don't need to include all the lines that have "<Enter>" alone; use as many as you need to position your return address correctly. For the original LaserJet or LaserJet Plus, in the opening line use "(8U", "28E", and "15L" instead of "(10U", "14E", and "18L"; in the last line use "521" instead ot "551"

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COMPAQ SLT/286:

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Compaq pulled few punches in supplying the SLT/286 with computing power; it runs a 12-MHz CMOS 80286 processor, a 24-mil-

■ COMPAQ SLT/286

The 286 That Could

Desktop power combined with innovative battery management; what else did you expect from Compaq's first laptop?



The SLT 286 folds up into a snazzy briefcase.

but the 2-pound power adapter is more clumsy.

The keyboard of the Compaq SLT/286 is tethered to the CPU by a 2-foot cord; it can rest on top of the main unit when working in close quarters.

Take the keyboard off the main unit and you'll find a trap door for removing the rechargeable battery units. The batteres can



A rear view of the machine reveals the standard ports, which are protected from the elements by a snap-on lid.

lisecond 40MB hard disk, and a VGA-level fluorescent backlit display, and it can be crammed with up to 3.6MB of RAM and a 287 math coprocessor. A nickel-cadmium rechargeable battery provides up to 5 hours of life.

The chassis is a gray plastic box that resembles a miniature suitcase and measures 13½ inches wide by 8½ inches deep by 4 inches thick. Unlike the NEC and Zenith laptops with which it competes, the SLT/286 makes no concession to fancy styling; no plastic was wasted on mere aes-

The screen, which tilts as far back as 180 degrees, folds over the keyboard in classic clamshell fashion. But the keyboard—in an ergonomic innovation that will make this machine either a must-have for those who don't like being shackled to a one-piece unit, or a tum-off for those who like simplicity at any cost—is mobile, tethered on a 2-foot coiled cord.

The mobile keyboard makes this my favorite among all current laptops because 1 could sit at a comfortable distance from the screen; even with my less-than-perfect vi-

N/A-Not applicable: this product is an A/C-only computer

sion, I could comfortably read the VGAmode text from a viewpoint of three feet away. And because the keyboard doesn't need to sit on top of several inches of chassis-as in other designs-and can be placed directly on a desktop, I found myself more at ease when tapping away at the keyboard. (I never fell for the sales pitch of other laptop vendors who said that the handle was built just below the keyboard so you could support your wrists as you type.) Of course, you won't be able to make use of this freedom in an airplane seat, unless you're able to commandeer the tray next to yours. But when the keyboard's properly stowed, the SLT/286 is one of the more

The handle slides flush into the front panel, centrally positioned to give you the proper center of gravity when carrying it. But you won't want to carry the hefty SLT/286 far without its optional (\$89) case: a well-padded nylon bag that has plenty of pockets, an external pouch, and a scalloped strap that hugs your shoulder. Since it weighs 14 pounds plus the 2-pound power adapter you'll need to carry

compact lantops available

(Products listed in ascending price order) BASIC CONFIGURATION Compaq Portable III Zenith SupersPort 286 Compaq SLT 286 \$4,999 \$4,999 \$5,399 640K RAM, 20MB hard IMB RAM, 20MB hard disk. Configuration includes 640K RAM, 20M8 hard disk, one 1 2MB one 1 44MB 31/1 disk one 1 44MB 3%-514-inch foody disk drive floogy disk drive, DOS 3.21 inch floogy thisk drive Microprocessor type and speed 80286 (8/12 MHz) 80286 or 80C286 (12 MHz) 80286 (12 MHz) menelons, HWD (inches) Weight (lbs.) 10.5 (with battery, 14.5) 14 (with battery pack) Modified IBM Enhanced Keyboard levout Modified 101-key with Modified IBM with four cursor control keys Gas plasma Backit supertwist LCD VGA backlit supertwist LCD ne. H x W (inches) 5.1 x 8.3 59 x 7.8 tion (pixels) \$40 x.400 545 x 405 Tested battery life (hours and minutes) Power supply (volts) 110/220 110/220 120/240

Compaq SLT/286 vs. Compaq Portable III and Zenith SupersPort 286: Summary of Features

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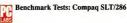
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■ COMPAO SLT/286



The Compact SI, 17286's performance in the NOP, 60286 instruction Mix, Floating-Point Calculation, and Comentional Memory tests is an expected for a 12-MHz 60286-based computer. The other tests lest ignite a different story, Disk speeds are extremely fast, a credit to the Compact 24-MHz 60246 in and extended memory filming are explain; improsselves the Compact 24-MHz 60246 in an extended memory filming are explain; improsselves the Compact 24-MHz 60246 in an extra 24

The NOP benchmark test is designed to measure raw clost speed and memory access time whils minimized differences in microprocessors and the elect of memory caching. This test essoutes almost nothing but NOP ("No Operation") machine code instructions in a big 128K loop.

time it takes to associal a selected agries of processorintensive tasks. The test program uses 80295 instructs code. These instructions are a subset of the total processor instruction set.

The Fleating-Peint Calculation benchmark test measures processor speed by looping through a series of floating-point calculations, including multiplication, division, exponentiation, and logarithmic and trigonometri functions. The benchmark program uses the floating-point floating

250K of conventional memory and heats it as a series of 64-byte records. Then, 15,354 random records are need into and written from this memory. The result shown is the average of the read and write times.

The Extended Memory benchmark test atocates 256K of ordered memory and treats it as a series of 64-byte records. Then, 16,394 random records are read into and written from this memory. The result shown is the average of the read and write times.

The DOS File Access benchmark test measures the stroughput rate of the disk being stread, it is the case, throughput ince are measured in terms of how long file disk as the perform common DOS file enlargement flux tasks to perform common DOS file enlargement flux tasks to perform common DOS file enlargement flux tasks to perform common DOS file enlargement flux tasks. The second file ends to second the end of the results actumed.

files—small-record files and large-record files—that are used by common PC applications. Files created using small records are typically used by distabase management programs, and large records are typically used for word processing and spreadsheet files. Leading a DOS program is site initiated by the lates record test.

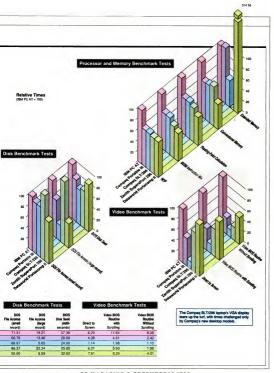
The BIOS Diek Seek benchmark test measures the time it takes to do a random seek using the diek it POM BIOS. The lest result includes minimal achieve overhead and may not parallel the manufacture?'s claimed everage access time. The lest program performs 1,000 seleks. The average result is shown in milliseconds.

The Direct to Screen benchmark test measures the bandwidth of the video adapter by writing directly to the display memory buffer. The state is performed in video mode 3. The entire screen is updated using the assambly language REP STOSW instruction with register CX equal to 2000. This is done 1,000 times, and the resist shown in

The Video BIOS Routline with Scrotling benchmark see measures the speed of the BIOS Teletype notine with scrotling. The test is performed in video mode 3. The screen is cleared and 240 lines of 50 characters each (including a terminating carriage stream and line feel) are written to the display through the BIOS Teletype reutine. Although the Rinz & Insec without to the display of the SIOS Teletype reutine. Although the Rinz & Insec without to the display of the SIOS Teletype reutine.

The Video BIOS Routine Without Scrolling benchmark test measures the speed of the BIOS Telespe routine without scrolling. The test is preferred in video mode 3. The screen is cleared and 24 lines of 80 characters each (including a limitingsing carriage return and line steet) are written to the display frough the BIOS Telespe routine. This is done in times, and the result shown is the total of

	Processor and Memory Benchmark Tests					
Performance Times (Times given in seconds except where noted) MOP			Posting- Point Calculation (without coprocessor)	Conven- liones Memory	Extended Memory	
8-MHz IBM PC AT Model 339	4.18	8 79	35.43	1.28	11.61	
Compaq Portable III	2.86	8.04	23.76	0.86	11.91	
Compaq SLT/288	2.86	6.03	23.79	0.88	5.60	
Zenith SupersPort 286	2.78	5.14	22.19	0.93	N/A	
Dataworld Portscomp II	2.76	4.56	18.43	0.60	36.52	





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It can happen with no warning. The sky goes dark and then it's there. A whirling funnel that destroys everything in its path, leaving little or nothing that can be retrieved. lust the way that disaster can strike your hard disk, scattering your data to the wind.

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for recharging, you won't want this baby dangling from your shoulder as you sprint down the corridors of O'Hare, no matter how comfortable the shoulder strap is.

DESKTOP POSSIBILITIES The Compaq SLT/286 could well be termed a convertible, although the folks who created the Houston desktop rockets would shudder at the mere suggestion of any comparison with IBM's poorly-thought-out Convertible. Unlike IBM's aborted attempt, this laptop moves smoothly from desktop to travel modes. Serial and parallel ports are standard equipment, as is a socket for the quick attachment of a VGA display, a full-size keyboard, and external tape or floppy drives. A 31/2-inch drive is standard, and-as this is a Compaq product you don't need to ask-it writes high-density, 1.44MB disks. One nice touch: if the diskette drive is accessing a disk formatted for low-density, the LED indicator glows orange; if it's working in high-density mode, the LED glows green. The internal hard disk drive, whether you have the 20MB or 40MB model, has its own orange I FD indicator

The standard-issue ports will be sufficient if you use the SLT286 as your desktop machine only occasionally. But if you 'te thinking of using the SLT as a 9-to-5 desktop and commuter-train portable, you'll probably want both the 5999 optional docking station and the S299 external storage module that plug into a socket on the rear panel. The docking station pratrain storage module houses the drive and draws power from an AC outlet. You have the choice of hooking up either a 54%-inch floppy drive, or a 40MB DC2000 tape drive.

That's not a lot for your money, especially when you see that the tape and copy of rives have retail prices of \$799 and \$275, respectively. Compag justifies expense with the explanation that their deasign objective was to provide a dream mentwide backup service that could maintain a fleet of portables, spreading on the investment over several machines. It does work well in that environment, but the docking station and external drives are enpensive luxuaries for a department of en-

If all you want is a high-powered lap

top, you won't be disappointed by the SLT/286 standing alone. The combination of a fast Conner hard disk and 12-MHz Intel 80286 processor make this a responsive machine, equalling the basic numbercrunching, data-saving power of its closest competitor, the Zenith SupersPort 286. You'll pay about \$400 more for the SLT/286 than for the SupersPort 286, but in addition to the richer expansion options.

How two can share 386 power for the price of one:

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Most desktop computers are entirely too big and too clumsy to make it off the desk, to say



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nothing of making it out of the office. But with the lightweight portable Toshiba

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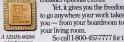
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you'll get a machine that positively crackles with fast display writes. You can add RAM to the SLT/286 in 1MB modules, until you reach 3.6MB (having started with 640K).

In the PC Labs benchmark tests, the SLT/286 was about 300 percent faster than the SupersPort 286 on some of the video tests. But you won't need to look at the test results to see a difference; you merely need to run a graphics program. The SLT/286

■ The SLT/286's video performance is a breakthrough for the entire laptop genre.

tames Microsoft Windows applications into submission and pops other display-intensive programs onto the screen with zest. In fact, this fast screen work is a breakthrough for the entire laptop genre: the SLT/286's video performance rivals that of 12-MHz desktop PCs.

While the display—with 16 shades or gray ranging from near-paper-white to almost-black—may not make as stunning a first impression as Zenith's bright blue screens, it proves a better choice in the long run. it's both sharper in writing lines and subtler when emulating shades of corto-is command a broad enough spectrum to make this one of the best laptop slightly yet. In Wadows applications, the sharp with the control of the control of the conduct lines traced on the white box leguous dark lines traced on the white box leguous dark lines traced on the white box leguous dear lines traced to the state of the lines while the properties of the lines while the lines while the lines while the leguous lines are lines while the lines while the lines while the leguous lines while the lines while the lines while the lines while the lines while lines while the lines while lines

The fluorescent backlit LCD does, however, suffer from some of the same physical limitations as its competitors': the thick bright outlines of the two fluorescent tubes are apparent, running horizontally across the screen, and in some graphics modes shadows occasionally trace after long blocks. Still, these problems are less apparent on the SLT/286 than on similar laptops, and they never proved to be serious distractions of sirractions.

Although I found full compatibility with CGA, EGA, and VGA software, the display has a maximum resolution of 640 by 480, which is just shy of the full VGA complement of 720 by 480 pixels. As a result, text mode characters are drawn in 8 by 16, rather than 9 by 16, character boxes; the space is saved between characters, but you'd never suspect it. Since none of the VGA modes use a horizontal resolution

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Visit us at COMDEX 88. Booth H7662 CIRCLE 806 ON READER SERVICE CARD greater than 640 dots, there was no need to change any of the graphics-mode resolutions. Each of the 256 VGA colors is assigned one of the 16 gray shades.

Compaq employs a polarizer and two panels to super-twist the LCD into crisp characters. One interesting side effect is that traces of red and blue can be seen when you view the machine from an extreme angle-a result of the polarizer screening out only part of the color spectrum at that angle.

POWER CONSERVATION Above all. power-conserving strategies embedded in the 286/SLT's design set it apart from competing laptops. In fact, Compaq's setup options (which are on-disk, not in

■ The degree to which the Compag SLT/286 lets you determine how you use its battery life is unprecedented.

ROM) give you control over more system functions than any laptop setup program I've seen. The setup program lets you select the option of having the screen black out after anywhere from 1 to 63 minutes of inactivity; touching any key brings it back to life. You can shut off power to the serial and parallel ports; designate the parallel port as LPT1, LPT2, or LPT3 if that will make life easier for you; set hard disk power-down to a period of from I to 21 minutes; or select the starting point for an overall system standby mode from 1 to 21 minutes

If you tend to access hard disks a lot in your work, you'll probably want to set the hard disk power-down period to a high value, otherwise you'll be waiting about 3 seconds for the 24-millisecond disk to wake up and do its chores. Of course, you're going to sacrifice battery life by keeping the disk drive spinning constantly. It's your choice. The degree to which this laptop lets you determine how you use its battery life is unprecedented.

Our battery benchmark test vielded 5:07 hours of battery life. The test involves continuous hard-disk access, which creates a highly battery-draining environment, but because the Compaq SLT/286 turns off its display while the test runs, its power management abilities did come into play. The SLT/286 performed better on this benchmark than any hard disk-based

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laptop to pass through PC Labs vet.

Standby mode is the most visible of Compaq's innovations in power management. Standby mode freezes RAM and video memory while bringing the SLT/286

into a fast hibernation; the system wakes up when you press the "Standby" button on the front panel. It takes about 3 seconds for the machine to fully shake off its sleep mode.

The standby power mode comes in three flavors: automatic, manual, and emergency. In automatic mode, the system takes itself into standby mode whenever you leave the 286/SLT fills for a present period of inte. The default period is 10 minutes, but it can range up to 21 minutes. But you are running an application that this disturbs—such as some types of real-time monitoring system—you can disable the automatic standby feature. The 286/SLT, the 286/SLT power mode with a couple of beeps, and a blinking LED will remind you that it's continuing to operate in that mode.

To return to normal power operation, just press the switch marked. "Standay" on the front panel of the 286/SLT. The standay switch is also used to manually part the laptop into standby power mode. It's handy for times when you plan to stop using the 286/SLT. For a short while but don't wish to close down what you're doing by shutting the power off.

Standby's emergency mode works at two levels. When the 286/SLT's battery has been drained to 10 percent of its power capacity, the system goes into an alert status and notifies you by beeping and flashing a low battery LED. Two different courses of action are defined by the power conservation system once the first low-battery sleft strips her been percent.

tery alert status has been reached.
If the system remains idle for Z minutes
while in battery alert status, the power conservation system takes it into standby power mode and alerts you of its move by additional beeping and by flashing the lowbattery LED. If you do not have access to
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point, you can change the battery pack if you are carrying a spare.

If you continue to use the laptop even though battery alter status has been indicated and the battery is drained to 5 percent of its capacity, if goes into standly mode and indicates its move. However, in this case you cannot bring the system out of standby mode unless you first plug it into a 120-volt source of power. That means you can t's area my data currently in memory unless you find a wall plug. By this time it is too late to insert a fresh battery tack.



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■ COMPAQ SLT/286

because that can only be accomplished with system power switched off.

In most case, the warnings are sufficient, and you'll easily be able to safely save data, power down, and swap-in a freshly charged battery. There's no auxility battery charger, so you'll need to devote some of the machine's downtime to Coeping a spare ready to go (it takes about 90 minutes to charge a drained battery if the laptop's not inue, batteries recharge in about 3 hours when the machine is running on AC cower).

The modem strategy is somewhat different. You can control whether the modem is switched on or off when you switch system power on, but after that there is no automatic timeout to turn the modem off separately. If you want power to the modem switched off to conserve power, you must do it manually.

FINAL IMPRESSIONS Overall, it's an impressive machine. Certainly you'll wish they could have shaved a few pounds off; I know I did, every time I carried it for more than a few feet. You'll probably also wish the battery life were longer; even with the

■ You may love the SLT/286's mobile keyboard, and the freedom the cord offers.

elaborate power management design, I averaged only 3 hours of word processing and spreadsheeting (you can stretch your power by keeping the display at a low brightness, although you probably won't want to).

The bottom line may be that you'll quickly fall in low with the mobile keyboard. If you use a PSZ-style 101-key keyboard (like those on Compan Deskpros) you'll feel right at home. The Ins, Del, and Esc keys are right where you expect them to be, the 12 function keys are full-size, and there's a separate cursor pad. You do share the cursor keys with Arrow and PRUp. PgDn, Home, and End func-



Compaq SLT/286 Compaq Computer Corp. 20555 FM 149 Houston, TX 77070 (713) 370-0412 (8000 231-0900

List Price: Model 20 with 640K RAM and 20MB hard disk, \$3,399, Model 40 with 640K RAM and 440MB hard disk, \$5,999; IMB RAM modules, \$799; external 360K floppy disk drive, \$275; external 1.2MB floppy disk drive, \$275; external storage module, \$299; external 40MB tape drive, \$799; desktop expansion unit, \$999; external \$799; desktop expansion unit, \$999; external

numeric knypad, \$149; second optional battery pack, \$129; carrying case, \$89; OS/2, \$325. In Short: Compaq's first laptop is speedy overall with superfast VGA graphics. At 14 pounds, it's no lightweight and with all options it's expensive, but there's power

enough in it to run Windows application OS/2.

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tions, but the Fn key is easy to reach. In typical laptop fashion, a number keypad overlaps the main keyboard, and, commendably, the markings on the shared leter-number keys are clearly marked. If you do lots of figure entry, you can order a 5149 external number keypad that plugs right into the keyboard. If you're working in a tight space, keep the keyboard snugly fitted into the unit, but you'll also enjoy the

freedom that the cord offers. Not everybody needs a laptop that runs OS/2, yet Compaq has signalled its intertion to build a lipie-med portable by mice OS/2 available for the SLT286. In fact, a Compaq engineer told me that the goal of overall compatibility was so fully met in this machine that there was no need to develop special OS/2 drivers for the SLT286, most laptops will require special OS/2 drivers to ensure compatibility with

their unique disk and video management. Not everybody wants to spend \$5,399 for the Model 20 with 1MB RAM and a 20MB hard disk, and even fewer will want to spend over \$9,000 for a laptop with

enough RAM and disk space to run OS/2.

Ordinary mortals need not be concerned: this laptop speaks to the souls of super power users and to no one else.

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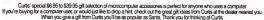
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Volume 7 Number 21 December 13, 1988

Graphics and Screen Statements

LINE — Draws a line or box on the screen SYNTAX: LINE [(x1,y1)]=(x2,y2) [[color] [.B[F]][.sh/si] (x1,y1) = coordinates for one end of line or corner of box. Default current location if omitted. (x2,x2) = coordinates for other end of line or

comer of box
color = color/attribute to draw with
B = draw a box rather than a line
BF = draw a filled box

BIT = draw a filled box style = integer containing bit pattern for noncontinuous line, for example, 101010101010101010 = &HAAAA

for dotted line. Style not permitted with filled boxes.

LOCATE — Place and define cursor (text mode only)

SYNTAX: LOCATE [rowli_losli_lcursoril_istarfi_storil]

row = 1.25

col = 1.80 or 1.40, depending on screen width cursor = 0 for hidden cursor, 1 for visible start, stop = start and end scan lines for cursor (0.7 for color, 0...13 for mone)

PAINT — Fill an area with a color
SYNTAX: PAINT (x,y) [[,paint] [,boundary] [,background]]
(x,y) = a point inside area to be filled

paint = if numeric, color attribute to fill with.
If string, area is filled with bits corresponding
to bytes in the string ("Bling").
boundary = color attribute defining edges of area.

to be painted background = 1-byte string used in tiling

PRESET — Draw a point in graphics mode SYNTAX: PRESET (x,y) [,color] NOTE: Identical to PSET except that color defaults to 0.

PSET — Draw a point in graphics mode SYNTAX: PSET (x,y) [,color] (x,y) = coordinates of point

color = color of point. Default 3 in medium resolution, 1 in high resolution.

PUT — Plot a graphics image stored with GET SYNTAX: PUT (x,y), array [,action] (x,y) = coordinates of top left corner of image array = numeric array containing image action = interaction with data arrady on-screen

PSET put exact image
PRESET put complementary image
XOR XOR image with screen
AND AND image with screen

SCREEN — Set screen attributes
SYNTAX: SCREEN [mode] [,[burst] [,[apage] [,vpage]]]
mode = 0, 1, or 2.0 = text mode, 1 = mediumresolution graphics mode, 2 = high-resolution

graphics mode.

burst = true (nonzero) for color, false (zero) for no color apage = active page. Selects page to be written to (text mode only).

vpage = visual page. Selects page to be displayed (text mode only).

VIEW — Define a viewport SYNTAX: VIEW [[SCREEN] [(x1,y1)-(x2,y2)

SYNTAX: VIEW [[SCREEN] [(x1,y1)-(x2,y2) [.[color][.[boundary]]]]] SCREEN = If absent, all points are plotted relative

SCREEN = If absent, all points are plotted relative to viewport; if present, points are absolute but those not in viewport are not visible. (x1,y1)-(x2,y2) = corner coordinates of viewport color = color attribute to fill viewport with

boundary = color attribute for frame around viewport
WINDOW — Redefine coordinates of viewport

SYNTAX: WINDOW [[SCREEN] (x1,y1)-(x2,y2)]
SCREEN = If present, y values increase from top to
bottom; otherwise y values increase from bottom to

top. (x1,y1)-(x2,y2) = world coordinates. When WINDOW is active, BASIC translates from world to physical

Event -Trapping Statements

COM(n) — Enable/disable trapping of communications

activity
SYNTAX: COM(n) ON/OFF/STOP
n = number of communications adapter (1 or 2)

ERROR - Simulate a BASIC error

SYNTAX: ERROR n

0.255. For user-defined errors use values > 200.

KEY — Set key trap

NET — see now your part of the property of the

Right Shift & H01
Left Shift & H02
Ctrl & H04
Alt & & H08
NumLock & H20
CapsLock & & H40

scancode = scan code of key to trap

KEY(n) --- Enable/disable trapping a specific key

SYNTAX: KEY(n) ON/OFF/STOP n = numeric expression 1...20

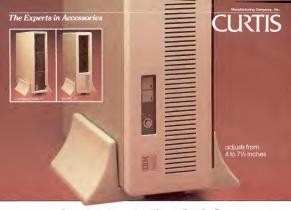
1..10 Function key F1..F10 Up Arrow
12 Left Arrow
13 Right Arrow
14 Down Arrow
15..20 Keys defined by KEY m.
(CHR\$/K@@ac)

+ CHR\$(scancode)

ON COM(n) — Set up communications trapping SyNTAX: ON COM(n) GOSUB subline n = 1 or 2 (number of comm adapter)

ON ERROR — Enable error trapping SYNTAX: ON ERROR GOTO subline

-Neil J. Rubenking



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RODUCTIVITY

AB NOTES: SPREADSHEET ANALYSIS ■ ETHAN WINER AND PHILIP MARTIN VALLEY

CRACKING THE LOTUS SPREADSHEET CODE

Manipulate the data in your 1-2-3 worksheets by writing your own application programs in QuickBASIC 4.0. The programs and examples presented here will show you how.

The very popularity of Lotus 1-2-3 virtually guarantees a large number of users who will want to stretch the program beyond its designed capabilities. Programming languages have long been used to manipulate printouts and .DIF files, and this article will provide you with the tools and examples you need to access 1-2-3 worksheets through Microsoft's easy-to-use QuickBASIC 4.0. (Lotus spreadsheet files include those in 1-2-3 and Symphony. But for simplicity, we will hereafter refer to them as 1-2-3 files.)

Two new features of QB 4-its support of binary file access and its ability to handle IEEE-format numbers-make it possible to read and write 1-2-3 data files directly. Earlier versions of QuickBASIC could access 1-2-3 files only by the technique of treating them as multiple 1-byte randomaccess records. BASIC-at least in the dialect spoken by Microsoft-was unable to read or write the IEEE floating-point format where 1-2-3 stores numbers.

With the newfound ability to speak (and listen) to 1-2-3, the only remaining problem is to understand the 1-2-3 file lavout. Here the work has been done by Jeff Walden, in his File Formats for Popular PC Software (John Wiley & Sons, 1986; ISBN 0-471-83671-0). Besides providing a complete description of the 1-2-3 file structure. Walden covers many other important file formats, and much of the information contained in this article is derived from his excellent book.

Reading and writing 1-2-3 files is not unlike other programming chores in that you'll probably want to split the task

among several subroutines. For that reason, we'll present routines you can easily separate into code fragments in order to read and write floating-point numbers, integers, and text labels.

PRODUCTIVITY INDEX

PC LAB NOTES Write your own 1-2-3 application programs in QuickBASIC 4.0. UTILITIES

Automatically record your PC's activity with LOG.COM. ENVIRONMENTS The mouse-an integral part in the

evolution of the PC POWER PROGRAMMING Ray Duncan concludes his series on Cequivalent assembler routines. SPREADSHEET CLINIC Find misspaced labels in 1-2-3; prevent

users from reloading 1-2-3. USER-TO-USER Perform repeated operations with a

single keystroke combination. POWER USER Avoid a dBASE III bug when linking

databases; edit Word macros easily. LANGUAGES A Turbo Pascal program that filters ASCII text in .EXE or .COM files. PC TUTOR

The archive bit tracks file changes for backup programs. CONNECTIVITY CLINIC

An explanation of X.25: a data communications standard.

LOTUS FILE BASICS 1-2-3 creates files that are intended to be read and written sequentially. Because of their varying lengths, they should be accessed through BASIC as binary files. Unlike conventional sequential files, data in binary files is not delimited by a carriage return/line-feed or comma, nor are text strings enclosed in quotation marks. Furthermore, when a file is read using binary access, BASIC does not treat CHR\$(26) as an end-of-text marker. This is an important consideration because that character value is just as likely to occur as any other in a Lotus worksheet file.

A 1-2-3 file may contain as many as 63 different kinds of records. We can safely limit our attention here, however, to the handful that play an essential role in transferring the information between a BASIC application and a 1-2-3 spreadsheet. When reading or writing 1-2-3 files, a BASIC program must be able to handle the following six types of records: Beginning of File, End of File, Integer numbers, Floating-Point numbers. Text labels, and Formula values

Other 1-2-3 data records, such as those for range names, window sizes, macro definitions, printer setup strings, and the order of calculation deal more with the operation of the spreadsheet than with the data itself. The records we're ignoring here in the interest of space are no more difficult to read or process, however, and if you want more information about their structure, Walden's book provides a complete description of each record type by op-

■ PCLAR NOTES

Regardless of its type and the information in it, every 1-2-3 data record follows the same layout as follows:

<Opcode> <Length> <Data>

The opcode is always a 2-byte integer that signifies the type of data that is to follow. The opcode 15, for example, tells us that the data section of the record contains information that 1-2-3 will interpret as a text label. The 1 ength is also a 2-byte integer; it reports the number of bytes in the data section that follows.

All of the record types that pertain to a specific cell contain five header bytes at the start of the Data portion of the record. These 5 bytes are included in the Length word at the start of each record. The first header byte contains formatting information such as the number of decimal digits to digity). The second 2 bytes together hold the cell row in which the data is to go, and contains the content of the percentage of the contains of the special percentage of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the special percentage of the contains of the contains of the contains of the special percentage of the contains of the contains of the contains of the special percentage of the contains of the contains of the contains of the special percentage of the contains of the contains of the contains of the special percentage of the contains of the contains of the contains of the contains of the special percentage of the contains of the cont

header, nor do the Beginning-of-File and End-of-File marker records.

Different kinds of records use different data lengths, of course, depending on the information they contain. Many, however, will have a set length. The length of a floating-point number, for instance, is always 8 bytes; an integer is always 2 bytes long. Because the Length word also includes the 5-byte header size, its totals in these cases would be 13 and 77 respectively. Other records, most notably labels and cell formulas, have a variable length.

READING LOTUS DATA FILES In the routines presented here, reading a data file created by 1-2-3 will always follow the same procedure. That is, you will use GET to read the data type, length, and header information. Then, the correct number of data bytes will be read into the appropriate variable type. The files are always read and written sequentially, from start to end.

Note that each time GET (or PUT) is used to access data in a binary file, the DOS file pointer is automatically incremented to the next position in the file. The BASIC SEEK command can also position the DOS file pointer, and our routines use it for this purpose when it is necessary to

skip over unwanted records.

The READ/123 RAS program primed here shows all of the steps necessary to read a 1-23 worksheer in Quidself C4.0. It will read any 1-23 worksheer file and display its contents on the screen. Routines are provided to decode and display to 8-1-23 version number, lades, and formular point numbers, labels, and formular values. All other record types are skipped, although their opcodes are displayed.

pulyeu.

READ 123 begins by asking for the mame of the worksheet to be read. If a file-aume is not given, a list off lies on the declaration of the control of the control

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Copyright (c) 1566, Siff Communications
C Magazina * Ethan Winer * Martie Vall-
leads a file written by Lotus 123
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is subtracted to sucleds the
Format, Column, Now, and 8 bytes
that were included to the scripin
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                                                                       'obtain the cext available file bundle
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                                                         get the next opcode 'and the length of the data that follows
                                                         handle the data according to its type
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adobast operates (recalc order, print
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GelFernat Pormat, Now, Column
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■ PC LAB NOTES

procedure is somewhat simpler than the alternative of passing the file number as a parameter to each subprogram.

FREEFILE is particularly useful for creating subrounies that will be used in other programs later. Before FREEFILE, it was up to you to assign and keep truck of which file numbers were in use. But in a subprogram that may be added to several other programs, it is not obvious which numbers are currently available. FREE-FILE always returns the next one available, which guarantees that a duplicular unmber will not be inadvertently assigned.

Once the worksheet file has been oppened, a series of GETs is used to pened as exist of GETs is used to pened as the pened and length bytes are always read first. Then, depending on which opcode was read, the proporties for the type of data that will follow. What your program does with the data will, of course, depend on the individual application. The READ123 program simply displays the file contents on the screen.

READ123 is structured as a DO.
LOOP, and each record is read and filtered
through a series of CASE statements to
process them appropriately. Since most of
the records contain a format byte and a row
and column number, a subprogram has
been set up to read and interpret these five
header bytes. When the End-Of-File opcode of 1 is encountered, the program
closes the file and ends.

BINAMY GETAND PUT When used for binary file access with QuickBaSIC4, the GET and PUT statements are implemented very differently from their random-access counterparts. The random GET and PUT and always openate not entite record whose size was indicated when the file was first opened. However, in binary files a variable is always specified as the source or destination, and the size of the variable inclines how many types are to be read or destination, and the size of he variable inclines how many types are to be read or

written.

Thus, to write the integer variable X% to a file, you would use PUT thus:

PUT #FileNum, Offset, X%
This writes the 2 bytes contained in the integer variable X% into the file at the speci-

fied offset. The Offset variable is optional,

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and if it is omitted, the data will be written at the current file pointer location. Note, however, that the delimiting comma must still be included. Because READ123.BAS reads a worksheet file sequentially, the Offset parameter is not needed or used.

The syntax for GET is similar to that for PUT: the file number and variable name are given and the offset variable is optional. Thus, to read 8 bytes from a binary file into a double-precision variable, you would use GET like this:

GET #FileNum, Offset, D#

Reading and writing string variables follows the same method in that the length of the string determines how many bytes will be read or written.

Notice that when using PUT (unlike the other BASIC file commands) a variable must be specified. A constant value or a string may not be used. For example, all of these statements are illegal:

PUT #FileNum, , 3 PUT #FileNum, , CHR\$(X) PUT #FileNum, , STRING\$(X, "A") There seems to be no reasonable justifica-

tion for this limitation in QuickBASIC, but Microsoft has, unfortunately, indicated that they have no plans to correct it.

INTERPRETING CELL CONTENTS The only opcodes that READ123.BAS

will process are 0, 1, 12, 13, 14, 15, and 16. All others are ignored. Each type of data record is handled by a separate CASE. statement appropriate to the type of data and the number of bytes to be read and processed. We'll discuss each case in turn.

Case 0 is the Beginning-of-File record. If you are certain that the file being read is a valid 1-2-3 file, then this record could be ignored. The data associated with the Beginning-of-File record indicates which version of 1-2-3 created the file. If an invalid version number is read, READ-123. BAS assumes that the file was not created by 1-2-3 and the program ends.

The only version numbers (as of this writing) that will be encountered are 1028, 1029, and 1030. Files created by Lotus 1-2-3 Version 1 or 1A are designated by 1028; 1029 indicates a Lotus Symphony file; and 1030 is either a 1-2-3 Version 2 or

Symphony 1.1 file. Case I is the 1-2-3 End-of-File marker



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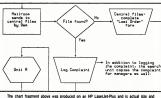
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and it is always the very last record in the file. Because there is no data, this record has a length of zero.

Case 12 indicates a blank cell in the spreadsheet. The format byte and the row and column numbers are the only data in a blank cell record. Notice that these records exist only for protected or formatted blank cells-other blank cells are not saved by 1-2-3 Case 13 is a cell that contains an integer

value (a whole number in the range of -32,768 to +32,767). After calling the GetFormat subprogram to obtain the format, row, and column numbers, the integer value is read and displayed.

Case 14 indicates a real (double-precision floating-point) number and is handled similarly to an integer, except that 8 bytes of data are read rather than only 2.

Case 15 is a text label. As with the others, the format, row, and column must be obtained first. However, before the label can be read, we must know how long it is. The length of the data was read in the secand line of the DO/LOOP, and this is the first time we've needed to be concerned about it

To determine the length of the label itself, 6 must be subtracted from the indicated length to adjust for the format, row, and column bytes, and the CHR\$(0) that marks the end of the string. Because GET uses the length of the destination variable to know how many bytes are to be read, an empty string variable is first defined to receive the text.

Info\$ = SPACE\$(Length - 6) GET #FileNum, , Info\$

The GET statement then reads the label data. The last byte in each label record is always CHR\$(0), the null character. We could have used SEEK to skip past that byte, but it's easier simply to read it into a dummy 1-character string. Because GET (and PUT) automatically increment the DOS file pointer, this is just as effective as using SEEK.

Case 16 is the opcode for a formula, which is the last type of data record with which we are concerned. The formula itself is tokenized, so that a single byte may be used to represent several characters. For example, the #AND# keyword is stored as a byte with a value of 20.

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The value of the resulting calculation is also kept in the file, however, and it is stored as a floating-point number. Therefore the result of the result of

The CASE ELSE clause is needed to skip past unwanted records. By simply GETting the correct number of bytes into a dummy variable, the program will be ready to read the next record, whatever it may be. The opcode is printed simply to show that it was encountered, but most BASIC applications would probably do nothing with it.

Even if we didn't care about displaying nonnumeric cells, a CASE ELSE would still be needed to avoid the "illegal function call" error that would result if an opcode had no corresponding CASE. This mandatory inclusion of a CASE ELSE is

an unwarranted nuisance in QuickBASIC programming. After all, if an IF test fails, the program simply proceeds to the next statement. Hopefully, Microsoft will change CASE to work like that in a future OB release.

THE FORMAT BYTE. Although the READ123 program merely displays the cell's format as a value, there's a lot of information packed into that single byte. As diagrammed in Figure 1, the format byte comprises three separate fields, each represented as a series of bits. You can isolate the individual bits in this byte fairly easily by using the BASIC AND and OR statements as described below.

The highest bit (bit 7 in Figure 1) indicates whether or not the cell is protected. This bit is either 1 if the cell is protected, or 0 if it is not. The code fragment below shows how to isolate and test this bit.

IF Pagent AND 126 THEM FRENT "This well is protected"

file (which we'll discuss shortly), the protected status may be assigned by using OR to set the bit.

Format = Format OR 128

Bits 4 through 6 describe the type of format, which applies to numeric and formula cells only. Because 3 bits are used to indicate the format type, there can be only eight possible values (0 through 7). The

coding for these bits is shown in Figure 2.

The lowest 4 bits in the format byte are used to indicate the number of decimal places to display (0 to 15) if the cell is numeric or a formula. If the format type is designated as "other" (see Figure 2), then bits 0 through 3 carry the meanings shown in Figure 3.

WRITING LOTUS DATA FILES Writing a file for use by Lotus 1-2-3 is actually easier than reading a file created by 1-2-3 because fewer record types are involved. Many of the records that Lotus worksheets



ted without impairing the ability of 1-2-3 to read and process the file. The program listing WRITE123.BAS shows how to create a 1-2-3-compatible worksheet file and writes all of the cell types described thus far.

As with READ123.BAS, this program uses FREEFILE to obtain the next available handle and then opens a file for binary access. While any filename could be used, using the .WKS extension ensures that any version of Lotus 1-2-3 will be able to read the file. If you're sure the file will be read by 1-2-3 Version 2.0 or 2.1 only. a

"WKI" extension may be used instead. Once the file has been opened, the first record to be written must be Lotus's Beginning-Of-File record. The opcode for his record is 0, the length of the data section is 2 bytes, and the data consists of a 2-3 that created the file. Again, we recommed using 1038 unless you are certain that the file will be read by only 1-2-3, Version 2.

After the mandatory BOF record has been written, we may now write however many data records are needed. We will assume here that the data will consist of either numbers or text strings, and that the numbers will be either integers or floatingpoint numbers.

WRITING THE CELL CONTENTS Since three different kinds of records are

being written, three separate subprograms are provided—one for integers, one for one of or integers, one for numbers, and another for text labels. Each of these subprograms is designed to expect a row, a column, a column width, and a value argument. The WriteNumber sub-program also expects a format string, which we'll look at in a moment. A call will be made to one of these subprograms for each cell written to the file.

It's important to understand how 1-2-3 maintains the row and column information. As you obviously know, the program uses letters for column designations, but this is true only when communicating with the outside world. Internally, both rows and columns are numbered, and these

numbers start with zero instead of one.

Row 1, therefore, is row 0 to 1-2-3, and column A is really column 0. You must

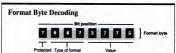
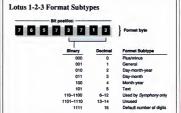


Figure 1: This diagram shows how each bit in the format byte of a 1-2-3 record is interpreted.



Figure 2: Bits 4 through 6 of the format byte indicate the type of format being used in a 1-2-3 file.



column A is really column 0. You must keep this in mind when writing a 1-2-3 file. Figure 3: If the format type (shown in Figure 2) is "other," then bits 0 through 3 of the format byte keep this in mind when writing a 1-2-3 file.

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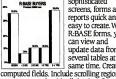
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or the resulting spreadsheet will have a blank top row and a blank first column.

WRITE123 contains a fourth subprogram that writes the column width information. For each column in a worksheet there must be only one column width record. The WriteColWidth subprogram therefore remembers which columns have already been assigned a width, and will not create a duplicate record.

Now let's look at each of these four subprograms in more detail, beginning with WriteInteger. The first step is to create the integer opcode: 13. Because PUT works only with variables, however, the value is first put into a temporary variable before it is written to the file. Next. the length will be written, which

rect, the length will be written, which for an integer is always 7 bytes. Remember, too, that the format, row, and column must be included within the data length if 1-2-3 is to understand it. The format byte is written next. In our sample routine it is set to the default format. That is, the cell is not protected and the display will show only as many digits as necessary.

Finally, the row, column, and integer Finally, the row, column, and integer value that were passed to the subprogram are written to the file. Once all of the notcessary with the color of the color with the color of the color of the color with the color of the color of the color with the color of the color of the color to a width of nine digits. Even though Write Color digits is called each time a cell is written, it rememben which columns were already processed and ignores subsequent calls for the same column.

The WriteNumber routine is similar to WriteInteger, but an additional format parameter has been added. The coding shown in the subprogram is "homemade," and may be changed to suit your individual needs. Rather than requiring you to deal with the various format types, WriteNumber accepts a control string that indicates the type of format and number of decimal places.

occiman piaces.

The control string consists of two characters. The first character is a letter indicating a Fixed (F) number of decimal places, the Currency format (C), or the Percent format (P). The second character is a number of decimal places and it establishes the number of decimal places required. Thus the strine "F3" will result in a fixed format





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■ PC LAB NOTES

field displaying a number to three decimal places, whereas "C2" would show the number as dollars and cents. If a null string is used or the format is invalid, the default value of 127 will be written.

The WriteColWidth subprogram is not really necessary and may be omitted (though be sure also to remove the statements that call it). If it is included, the column widths will be set to match the field

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lengths of the data being written. Thus, when the spreadsheet is loaded by 1-2-3, each field will be displayed in its entirety. Otherwise, the column width would default to nine, which would hide some of the text label contents.

The column width record itself is like all the others in that it has an opcode (8), a length (3), and a data section. The 3-byte data section contains a 2-byte integer for the column number and a 1-byte value for the width. Since this is a single byte, the value is assigned as CHRS(#) where # is the desired column width.

are desided contain when the MriteLabel. The last subprogram is WriteLabel, about which there are several points you about which they are several points you as maximum of 240 characters; the IF statement shown in the listing checks and statement shown in the listing checks and subject to the statement shown in the listing checks and subject to the statement shown in the listing checks and subject to require this safeguard, but should you write a halfed record that is too long, I-2-3 won't be able to read the rest of the file.

The opcode for a label is 15. The record length is variable and is set to the length of the text string, plus seven. These 7 added bytes include the column and row numbers, the format byte, the CHRS(39) preceding the text, and the mandatory CHRS(0) that terminates the string.

The CHR\$(39) is a single quote character, which tells 1-2-3 that the string will be left-aligned in the spreadsheet. You could also use a CHR\$(34) (double quote) or the CHR\$(94) (caret) for right-aligned or centered strings, respectively.

tered strings, respectively.

The final record that must be written is the 1-2-3 End of File (EOF) marker. This is the simplest of all records—the opcode is 1, the length is 0, and there is no data section. Depending on what else the program you write may need to do, the file may now be closed with BASIC's CLOSE.

Statement.

With these routines providing the foundation, an astute programmer should be able to manipulate 1-2-3 files in whatever manner needed. You can copy the various sections of code that read and write the spreadsheet data, or use them as the basis for creating subproperams of your own. ³⁰

Ethan Winer is a contributing editor of PC Magazine. Philip Martin Valley is an industrial engineer for Midas International.



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LOG YOUR PC'S ACTIVITY



Automatically track the dates, times, and names of the programs you run to produce an invaluable log with this handy utility, LOG.COM.

If you maintain an office at home and deduct the cost of your hardware and software, the IRS can require you to produce records documenting their use. If you bill by the hour for contract computer work, you need an accurate way of keeping track of on-line time. Or if you manage an office full of PCs, it may be important for you to know just how they're being used.

However, maintaining a handwritten logbook is an intensely annoying chore, especially if computer sessions involve multiple jobs using several different pieces of software. Computers are supposed to remove mindless burdens for the user, not create them.

Jus put LOG. COM in your AUTOEX.

E. BAT file, however, and your computer will do its own record keeping. LOG is compact, memory-resident utility that keeps track of every application program you run, complete with dates, times, and even the command line parameters you used when invoking your programs. Just one glimpse at the ASCII log files LOG generates and there will be no question about how your computer has been spending its time.

The easiest way to get LOG, COM is to download a ready-to-uru no poy directly from PC MagNet, as explained in the side-bar 'LOG ib Nodem.' The LOG ASM source code is printed here, if you wish to coure code is printed here, if you wish to source code is printed here, if you wish to DOS-manual-Look-alike page. If you don't have a macro assemble LOG lock-alike page. If you don't have a macro assembler or a modem, running the program LOG. BAS (also printed

here) in BASIC will automatically create LOG.COM. Both LOG.ASM and LOG .BAS are also available for downloading from PC MagNet.

USING THE PROGRAM LOG can either be included in your AUTOEXEC. BAT file for automatic loading every time you power up, or you can run it from the DOS command line. The syntax for doing this is

LOG [filespec] [/U]

The optional filespec parameter allows you to select any or all of the parts of a file specification, including the drive, path, and filename. If you onit the parameter entirely, LOG will open a log file named USAGE_LOG in the not directory of your default drive. To use the default USAGE LOG ITEMS but kept in the PUSM TEXT subdirectory of your current drive, for example, you would enter

 LOG is a compact, memory-resident utility that keeps track of every application program you run, complete with the date and time. LOG \PCH\TEXT\

(Be sure to include the last backslash, to tell LOG that TEXT is a directory, not the name of the log file you want to set up.)

To uninstall LOG once it has been loaded, just run it with the /U parameter. If LOG is the only (or last) TSR program installed, uninstallation will almost always succeed. If it is unable to remove itself from memory, LOG will display the message "Carnot uninstall."

LOG creates plain ASCII files that can be output to your printer or reviewed onscreen using the TYPE command, a browse utility, or a text editor. A log file contains one line of information for every program you run during a session and one line for the "idle" time you spend at the DOS prompt between using programs. LOG does not record the use of internal DOS commands—commands that are not stored as external files on your DOS disk but contained wholly within the operating system—such as DIR, CLS, and TYPE. It does record external DOS commands. such as FORMAT, DISKCOPY, and CHKDSK.

Figure 1 shows a sample log file. Except for LEVEL, the column headings are self-explanatory. The DOS command line level at which you originally invoke LOG is designated level. A program that's run from the command line runs at level 1, and when the program terminates, the level returns to 0. Many application programs, such as WordFeyfer and Quick C, allow you to "shell out" to DOS to perform filerelated or other command line activities

UTILITIES

and type EXIT to return to the application. Shelling out of an application involves loading and running a secondary copy of COMMAND COM, and since the application program is running at level 1, the new copy of COMMAND COM is run at level 2. When you cuit, you return to level 1. Another program run from the level 2 command line runs at level 3, so you can see how easy it is to become nested several levels deep. DOS will allow nesting at as many levels as memory permits. LOG will

handle depths of up to 10 levels.

Nesting also occurs when any program loads and runs another, not just when COMMAND. COM is invoked. If you use a DOS shell, for instance, you'll notice that it is loaded at level 1, and other gamma are run at level 2 and higher. Shells load and execute application programs directly, without the benefit or hindrance of

a command processor.

LOG ignores programs you attempt to
run that result in a "Bad command or file
name" message from DOS. It also recovers gracefully if its log file is accidentally
deleted during the middle of a session. It

simply creates a new one, picking up right where it left off in the old one.

HOW LOG WORKS LOG is able to tell which programs you run, because DOS uses function 48h of interrupt 21h to load uses function 48h of interrupt 21h to load you cancer for this function is shown in Figure 2. Function 48h—her EXEC function—is one of the most powerful and complex functions DOS provides. When installed, LOG revectors interrupt 21h and monitors every call made is it. If on entry the AX to the contract of the contra

dler.

EXEC expects a subfunction number to be passed in AL. A value of 0 means the program file is to be loaded and executed, while a value of 3 indicates it's to be loaded as an overlay and not executed. LOG keeps track of only those calls that load and run an application. Calls to subfunction 3

are passed on to the operating system.

When LOG intercepts an EXEC call, it records the name of the program file being

DOS Function Call 4Bh (EXEC)

AH 4Bh

DS:DX Pointer to an ASCIIZ string of a filename to be loaded.

Pointer to parameter block consisting of more pointers

AL 0 to load and execute the

flie pointed to by DS:DX. 3 to load program only (used by overlays).

Figure 2: The calling sequence for the DOS EXEC function.

EXECed and the command string passed to it. The DSAD register pair points to the ASCIIZ program name (an ASCIIZ string is an ASCII string terminated by a null, or zero, byte) while ESBX points to a parameter block. The parameter block is a table of addresses of pertinent parameters that also contains the address of the command string. The command string the strin

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Figure 1: LOG.COM produces a complete record of all your PC activity to satisfy the IRS, client billings, or your own curiosity.

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	10)				
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EDCPTAG	DW.	# :BERG flee				
ERROR AX	24	y restanded acros information				
	295					
ERROR CE	246				2.0	
ERROR DIE						
	Det.					
IN SORE	044					
ERPOR D5	24					:Increment respirancy cou
		3 007 (9)				
						ropen the log file
						(LOG ASM con

LOG.ASM: The assembly language source code for LOG.COM, which automatically keeps track of your PC use.

	MEL ADD MOV ADD MOV DEC CALL CALL MOV ADDOME	NI,1 01,0070ET TIMES 01,01		1	P0#	21 21	
	BOY			;mave regist	tere equi-	while post-processing	is performed.
	MOV		put provious level number	l	2068	AX	reeve general registers
	CALL	MITTE ENTRY CLOSEFILE EXECULAS, 1 DG: BOTHING	perite log entry		PERM	C0	
	CMA	CLOSSFILE	perite log entry pelces the log file pest manc flag	1	PUSE	02	
	AER/200	Delactated		1	POSE	01 01	
	POP	BX DB	reators EXEC register	1	P018	EF DE	
	909 909	DIX BIX		JSerre extens		Rd	
Record the I	tame of	the progress just EXECUT.		1 save excess		CS TALGERMATION IL DAGG ABIL	sion is 3.15 or later. sat D6 to code segment
	PURE PURE	the progres jost EXECUT.	passe EX and EX for later	1	PCO AMECUNE		
		50	rage 34 equal to 34	1	CHP JB	DOSVERSION, #388X	jokip 1f ont 3.18 or later
	POR MOV SLOR MOV CLD MOTIVE MOV BLOW BLOW BLOW BLOW BLOW BLOW BLOW BLOW	01.08	peren for terminating coro	1	PORK		jeeve bd
	2.08	EL LIM	le AGCIIX filenese	l	POR NOV NOR NOV	82,560 92,92 314	:get extended error
	CLD			1	127	ni	
	MAP VIZ	BX. 127	rtrenefer etring length	1	200	CE+ XXXXXXX DE ,DE	lest on to ode semest see
	200	SCARE SE, 127 SE, 68 CX, SE ST, DI ST, 2		1	900 900 900 900 900 900 900 900	EEFFICE OR, OR EEFFICE EE, EE EEFFICE CE, CE EEFFICE DO , DE	jears return value of DE jeat on to code segment age: jears remaining register; values in 189900 array
	1604	NI,01	jest andies address to SI jest NI to lest character jest OF for reverse string ops jecom bechverde for first j character to filesomm		mov.	MANAGE CE, CO	, 41100 1- 11000 11107
	BTD.	81,2	seet MI to lest character		3600	EXPANSE DA DE	
MBC21	L0098		recan berkwards for first	1	MOV	EEEECG 01.01	
	HOW HOW HOW LOOMS CHO JE CHO	Execs) Character to Ellevann	jRecord the	Depleter of	tart/sol time and write	an estry to the log.
	CHEP	AL, "\" Exect AL, ":" esect Exect		EXECT:		BECOME TIME	an entry to the log. Idecrement resetrancy count Irecred the excreet time
	Loor				CMA	MACORD TIME DO, OFFERT FILESPEC	come the less file
1638	JE LOOP DEC ADO EUE	61.3	spoint 81 to first character	1	2009	BI. LAYEL	popen the log film point #I to start time and EI to end time
	BUE	EX, CX CO, BX	spoint 81 to first character scalculate length of filename strenafor length to CS sclear DF epain set EL to code segment	1	ERC.		; III to end time
	CLO	04	pelear DF equin	1	445.	81,1 81,1 81,000 THE	
	CLO POSE POP HOP HOP HOP ACO HOP STORE				SHE. AND MAY SUB MOY INC CALL	61.61	
	1077	AL, 13	preloniste offest into table , of progres names	1	900	01,4	
	M/L	DL. RE) at broken seems	I .	INC	AL, SYDE PUR LEVEL	i in Al
	100	DI, OFFERT MARKS			CATT	ANTAL BALAS	jurite log entry
	9677	AL. CL	pwite filename character	Indentors or	mov tended ers	EXECPLANT.	relear size flog
anct:	LODES		rwite filename character ; count into table ;convert loweroses characters	1pestore ex		MALTE SPENT CLOSEFILE SENCYLAD, 5 OF Information of DOS DOSVENICOS, \$1644	iput previous level number i in AL jurite log entry julies the log film julies NAME fleg reriem is 3-18 or later jukip if not 3-18 or later
	007 23 007 38	MAL, "s" MACS AL, "s" EXECS	to upper and copy filesame	10	31E 2007 2007	annes	
	CHP	M. 'e') Tare creat	12	807	es, foles DE, offset MESSON_AX	prestore information with punction toh
		MERCS AL. SOFE		terminators re-	IST		the narest program.
1 49 GE	9700E	asset		xuect:	intern a secure Prop	first time and emit to permovation st op op op op op op op op	restore registers
Becard the		Lice perced to the progre	on fact Execut.	ALEKT.	Ne	94	Learners Leditaters
	POP		Ifeatore Es and Ex	1	100	*	
	POP LOS MOY TOR THE	87,82+(88+2) CL,(87) CR,CR CR CR	pload pero string address		200	ii	
	BOY TOR	CL.(81)	iget length		Ne	iii	
	IRC	ex	contra secret to compare the		POP	ä	
	POP		point mp-DI to command lice hoffer in mode segment		POPT	-	
	804	EI, COTPET CONC.INE	sport comend bloc	DOSESTT: DOSEST	ERRO		
Bastere reg	Leter we	moves toos origionlly passed by BE	the parent progress.				
	P00 P00			settry on	- code se	meet	tes a new one. could not be opened/erested
	POP	87 81 81 08 CL				med/greated, set-file	could not be opened/erested
	POP POP POP	ěi		ADDRESTED	144	1	
	P00	CE CE				•	
	100			COURSTLE	PROC	PEAR EXICODE	
tave regist	ece agai	a since the DOS 2.8 skec	function destroys them.			ADDRESSE, DE	parre filospec address
	PCOR	u u g		i i	190V		parre filespec address pattempt to open en esisting place file present of eall feiled patter file handle present to be position file polimer at the end of the file
		α			30	OPER3	phranch if call feiled
	P198	81 81			1004	NX, NX	trasefer it to bu
	PURE PURE PURE	01 89 00			3009	60,42028 CX.CX	specition file pointer at
	PUMB	pe			THE COLL	BX, BX BX, BX, BX BX, BX, BX, BX, BX, BX, BX, BX, BX, BX,	, 1114
autom the we		IS and or call proc. on	restore the stark		THE		perite date to los file
	HOW HOW HOW BEEL GEL CLI	COLUMNOCAL, AX	restore the stack.		JWE	CALLPLAG	jurite date to log file ; if this is the first ; mail to opportion
	NOV	BE, CO. (LEVEL) BE.	the STACESTS and	CPERSON.	CMA	WRITE DATE PRITE MEASUR	
	610.	BX,1		orași.	CALL	PRITE_READER	other write header line
	HO4 CP1	WORD PTR CHI[STACKERS]	pdisable interrupts and EXI, EX save the EX and BO EXI, EF registers				
	HOW HOW PANEL CALL LARP	NOSD PTR CS: (STACKSTS) NOSD PTR CS: (STACKSTS) EX, CS: (RANDCA)		(Cell to op	en en meis	sting film feiled. Cre	eto m new com and leiticlise is jettempt to mreate a new ; file of the seem name
	PURE	297215	FURNE the flags register and call DOS EXEC store flags temperarily in EX resealteinte table index		3008	CX, CX	file of the seme name
	LAND		retore fless temporarily is MI		197	DX. ACCRETEC	
	BOY DUC SHL	BE, CS+(LEVEL)	presencelate table Indee		SOV BOY BOY BOY BOY	COTEM 3 NAME OF THE OWNER O	past on arror paters file bandle promoter it to RE past serry fing parite copyright test
	400	BX BX,1			1007	READER, BE CALAPLAG, 1	stransfer it to be
	CEI		pdiamble interrupts and sojjam ; restore 80 and 87		9077	CALAFLAG, 1	part setry flag
	3604	SO, WORD PTR CO. (ETACKS)	milesi ,		MOV	8X, 49E CX, 78	,,
	671	re to their conditions be	creators flore		187	DO, OFFEET PROGRAM 218 OFFEE	
Restore the	registe	re to their conditions be	fore gate was called.		2007	OPERS	peest
	POP	ES EX					
	POP	BP DI SI		CLOSEFILE e			
	100	01		CLOSEFILE	PROC	WEAR	
	CLI HOW HOW 67I BARY regists POP NOP POP POP POP POP POP	ei cu		CLOSEFILM	PROC MOT	DECODE BX, 300	(LOG ASM continu

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	MOA	SE, BARCEE 21 H		1	CALL	WHITE HIM	
CLOSSPILE	RET	218			20°	RY, RANGES	:write ":" to separate
	EMOP	one-line entry to the			MO4		
Entry: D	SISI - et	ert time d time et resetrency level	log tile.		HOY THT	219 AL. (61) 86.,85	perite minutes to log file
	- 1e	n time et reestrency level				SC. SC. WRITE NOW	
ASTLEVEL	0s	,		WASTE TIME	RET		
SATE DETAIL	PROC	SEAS			wites th	e elepend time to the left time, point - end	on file
-	ARRUNE		setore lest level number		lest - et		time
	GALL HOY CALL	CK, 4 WRITE SPACES	perite start time	DELTA	00	3 809 (2)	
	PULIS		;seve etart time ;write end time	MATER DIES	PROC	PEAR DB-CCCF	
		ST.DI WRITE_TIME	perite end time		NOV	BB:COOR AL, [DI] AL, [BI] CL, [DI+1] BL, [BI+1] AB, [DI+2]	pretrieve starting sed ending seconds, minutes, and bours
	HOV.	CK, 3 WRITE SPACES			HOV	CL, (DI+1)	: hours
	POP	ST AND AND A	pretrieve etert time		HOV HOV HOV CRP	AB, (01+2)	
	MOV CMA	CX,5	perior elepana com		CNP		ilf ending seconds is less) thes starting, add is to) ending seconds and) descend ending minutes ilf ending minutes is less) them starting, add is to) ending minutes and) desirement ending hours) for ending hours to end the transmitted hours to en
	MOV	AL, LASTLEVEL	rwrite reentrancy level		JAN AJO DEC	WHO IPY1	; them storting, add 60 to ; ending seconds and
				*901991:		AL, ML	; decrement ending minutes ;if ending minutes is less
	MOV CALL	CX,6			308 A30 BEC CRP 308 A30 BUS	MEDERY2	then stortleg, add 68 to
	MOV	MAITE SPACES AL, 13 LASTLEVEL	preintlete offeet into	MIDITEZ	DEC	CL. M.	decrement ending hours
	MOV AGO	DE, OFFERT NAMES			366	CL, 24	then eterting, edd 24
	MOV	AM, 485 6X, 0X	prite program name	49D1FF31	828	AN, SH DELTA-2, AN	redculate seconds difference
	X00	CL, [SK]		1	907 906	AL, AL DELTA, AL	retore it resculete minutes difference
		CX BX, HANDER		1	928 928	CL.OL CELOL CELOL	retore it realculate houre difference
	1sc			1	MOV MOV CALL	SI,OFFISHT DELTA	retore it purite house and minutes to the log file rwate ":" to log file
	POP	21.0 8X		1	WOY WOY	ST. OFFICHT DELTA MRITE TIME AN, 45%	; the log file ;write ":" to log file
	CIO CII	FERCILAG, P WODARDS	regit now if this entry is a return from Exect resignists gamber of spaces	i	1607		
	8077 4 UB	CX,13 CX.6X	resignate number of spaces		MOV	CH, 1 OH, OFFSHY COLOR 218	
	ADD CALL	CK,5 WRITE_SPACES		1	NOA ACM TALE	AL. [82+2]	rwrite seconde to log file
	HOY HOY	EX, OFFERT CONLINE CL, [SE]	pwrite command line peeend ; to the lest program	i	CALL	MRITE_PER	
		CB, CB	samed to the log file	WRITE OIFF	ENGF		
	20308 8600 8600	CR, Ca BOTANIAS AB, 4811		WRITE WIR c	everte a	binary byte value to A	SCII and writes it to the los
		SE, MANDLE DE, DEFENT CONLINE+1		; file." Velu	muet be	between 9 and 99, incl ion, SL . 9 = include 1	SCII and writes it to the log usive. medies serves, 1 = don't include
OPANHE	CALL	MAILE CHTL	and line with cutte	FILEWOOD	CW	7	
DITE DATES	AET THEF		,	WESTE MICH	PROC	HEAR	
WHITE DATE !	crites th	e current date to the				D8 (C008	
CONTROL		"JacksburkprkeyJund		1	AAM ADO OR	AN, 39390	comment to Sch in AE comment to AMCII comment leading many to space if SL = 1 on entry
ENTURY	09	*13*	manufacture and an analysis an	1		NG, AL Wintel AM, 388	pace if SL - 1 ee
RITE_DATE	PROC	MEAN DE-COOK		1	CHEP JUSE HOW RICHES	999/365 AN. 204	; estry
	CALL	MRITE_COLP AS, 2AE	rekip oom line roet dete from DOS	WRITING I	WOV	AN, 298 AN, AL FILEWOOD, AN	iewas bytes
	Det				WW		other with then to the
	Det	cz cz	reeve it		WW		properties (store than the properties of the pro
	Det	CE CE OR Al-De	reeve it		HOV HOV HOV HOV	SK, NAMOLE CK, 2 DK, OFFEET FILENOSE	paters theme prises write them to the plog file
	PUEB PUEB PUEB NOV EOR CALL	218 CH OH AL, OL HI, HI	reeve it pwrite day of the month to g the log file		907 907 907 907 387	EX, NAMELE CX, 2	istore them them wilto them to the log file
	PUSE PUSE PUSE BOY BOR CALL BOY CALL	218 CE OR AL, OL METS_SCH CE, 1	perite day of the month to the log file tekip e space	MILTE FOR	HOV HOV HOV HOV DPT RET ENCO	AN, 486 SX, NAMBLE CX, 2 DX, OFFEET FILEWOOD 216	; leg file
	PURE PURE PURE HOV SOR CALL HOV CALL POP ORC	218 CE DE AL, DE MESTS_ACO CE, 1 WRITE_SPACES DO	perite day of the month to the log file tekip e space	WESTE BEADE	HOV HOV HOV HOV JET EXT EXCO	AN, 486 8X, NAMBLE CX, 2 DX, OFFRET FILEWORD 216 bbs column titles to th	, log file
	PURE PURE PURE HOV SOR CALL HOV CALL POP ORC	218 CE OR AL, OL SI, SL WRITE_SPACES CG, 1 WRITE_SPACES CO OR	reeve it pwrite day of the month to g the log file		HOY HOY HOY HOY 28T ENCO Veritor	AN, 486 8X, NAMBLE CX, 2 DX, OFFRET FILEWORD 216 bbs column titles to th	, log file
	PUEB PUEB HOV ZOR CALL HOV CALL POP DOS BOY ACRES	OIR CE OIR AL, DE BL, BL MINTER BOW CE, I MINTER SPACES CO. CE, CE CE CE, CE C	perite day of the month to the log file tekip e space	WEITE HIADE	HOY HOY HOY HOY JET EXCP Veritee	AN, 486 SX, NAMBLE CX, 2 DX, OFFEET FILEWOOD 216	, log file
	PUEB PUEB HOV SOR CALL HOV CALL POP ORC BOV XOR HOV 3CES AGO	JIB CE OM. AL.OL SI,BL SI,BL SITE_SIGN WRITE_SPACES CO. CB CH.OS C	reeve it purite day of the menth to the leg file phip e space restriave menth from eteck restriaves menth from eteck restriaves menth from eteck toblection of the into Morra table of text for the current menth	TITLES DOUBLESON	HOY HOY HOY HOY 28T ENCO Veritor	AM, 485 SM, MANDLE CK.2 CK.2 CK.2 SM, OFFRET FILMOND 218 the endumn titles to th "START", 5 DOF (32), "E "ELAPRID", 4 DOF (32), "E "STARTMENT, 4 DOF (32), "E "STARTMENT, 5 DOF (33) "A" "STARTMENT, 18 DOF (33) "A" "THAN	, log file
	DITPUSE PUSE PUSE ROY SOR CALL ROY SOR CALL ROY SOR LOOP ROY WOR ROY WOR ROY ROY ROY ROY ROY ROY ROY ROY ROY R	JIB CC	perite day of the month to the log file tekip e space	WEITE HIADE	HOV HOV HOV HOV 197 207 200 00 00 00 00 00 00 00	AM, 484 SN, NAMPLE CX.2 SOFTHET FILEWORD 216 Heredown titles to the "START", 5 GCF (12), "E- "ELANGED", 6 CCF (12), "PROCESSOR", 18 CCF (13) BEAM	; leg file = leg file. BP-5 our (32) LAVEL-1, door (32) -TANAGETERS-, 13,18
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■ UTILITIES

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WRITE SPACES	writes (I specie to the log file			CALL		perments complete filespec
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					NOV.	DI, OFFEET CHESE+66	
KITE SPACES	PROC	MENS DE LCODE			904 906 907	AL, AL CL. SI	the ASCIIS string
			:save coulter			BCMB	
	MOV MOV	AZ,488 SX,RANGGE	putits one space		DEC	977E PTP (07+11.*)*	research defends fileness of
	MOV				CAP JNE BOV	SYTE PTR [03-1],"\"	reppend default filename if lest character is a backslast
	207 237	DE, OFFSHT SPACE			MOV.	SI,OFFSST DEFSAME+1 CK, 5) Deckelast.
	NOP LOOP		pretriese count		REP		INVITE ANCITE SAFRIANTES
		MALLE SANCES	;loop setil done		908 97066	AL, AL	
RITE_SPACES	ESOP			: fret the file	spec at	of create the ing file if	it doesn't already exist.
	records t	the currect time in the s	let designated by LEVIL.	TESTSPECS	SOV.	DE_OFFERT CHRIST-68 OFENTILE DE_OFFERT ERRORES	ropes/create log file
					NOV.	DE, OFFIST ERRORES	perror if file could not
DCORD_TIME	PROC AZE/28E	NEAR DEICHOE			CALL		be opened close log file
	NOV	AII., 2CB 21.0	get current time		CALL	NECONO 22ME AX. 300Es	record starting time record version of bos 1 LOO is reseing under
	INT		:calculate offset (ato table) of start/end times		MOV INT		1 LOO is remains under
	BETT.	87,1 87,1	; of start/end times		RENG MINU	AN, AL DOSVERSON, AN	
	BACL MOST	MISS PTS TIMESTAXI.CX	sature current time	1Rook Leto Let	MIN TOUCH	21b and deallocate the s	rogram's environment block.
	NET	WIND PTR TIMES[SE], CE STTE PTR TIMES[SE-2], DE	,		HOT	AK, 35216 228	peave ald interrupt vector
BKIT_GROOD	RET					WORD PTR INTELL, AN	
					MOV.	WORD PTR INT21E, AE WORD PTR INT22E[2], ES AL, 2521E	rtheo mat the new vector
and-byte buf	*** #506	seed after LOS becomes a			HOV HOV		, ast the new vector
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	:	PC + 28	retorage array for RS			NI. OFFICE CADIN-86	propy filepest string to
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	netelle :	or uninstalls the program			MOV MOV	DI, OFFSET HARD CK, 7	progres cames beffer
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000562 000003	08	"Deage: LOG [filesper] "Sot Installed;" "Causet Uninetall;"		;bisplay copy:	right m	otice, then terminate and	remain resident to memory. Idiaplay copyright
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	PROC ASSUME py of Lo CLD	SEAR CS-CODE, DS-CODE 1 is already resident in	memocy.	BINCOL dealler BINCOL dealler Interrupt week Entry: ES - 1 Exit: CF clo	mates to ter dispersion represent ter - pr	he assury block addressed placed on installation. to relesse rogram uninstalled, CF on	by HH and performs the
	PROC ASSUME Py of Los CLD HOW NOR WOOD	SEAR CE-CODE, DE-CODE Is already resident in WORD PIR (SECIE), 8 AR, 6E	pero 65 for start	PERCOT deallor PERCOT deallor Interrupt vect Entry: ES - Exit: CF cl	mates to ter dispersion our - pr PROC MANY	to assury block addressed placed on installation. The release regrae uninstalled, CF on MEAN CF. PS	
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Goo if a cop	PROC ACCUME PY OF LO CLD HOW YOR HOW TINC HOW CMP JE	# SEAN CS:COSE, DS:COSE IS already resident in WORD PTR (SECUR).# AK, 6E AK, 6E AK, 6E AK, 6E	learn off for start learn off for start learn off for start largest value largest value	HITTALINE REMOVE deallor letarrupt weet Entry 18 - ; Exit: CF CL	mates ti tor dispert er - p 7900 HOV HOV 197	the assumpty block addressed placed on installation. to release regress uninstalled, CF on FRAN CK, ES AK, 39218 218 AK, 50	
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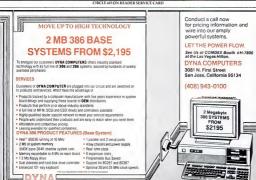
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called the command tail) is exactly analogous to what's typed after the program name on the command line. Figure 3 shows the layout of the parameter block and gives a brief description of its contents

After LOG copies the information it needs from the EXEC call, it increments the level number and calls EXEC to load and run the program. When control returns to LOG after the program terminates, LOG decrements the level number. The level number is used as an index to a set of internal, fixed-length tables LOG maintains in order to record up to ten nested layers of program names, start and end times. and other parameters. In the unlikely event that the reentrancy count exceeds nine, LOG defers subsequent EXEC calls directly to DOS, until the count drops to a tolerable level again. Exceeding this limit would allow LOG to overwrite its own data and to overwrite information in an area of memory it doesn't own. Every call to or return from EXEC con-

stitutes what I'll here call an "event." When a program is EXECed, another pro-

INT 21h Function Call 4Bh Parameter Block

ES:BX → WORD Segment address of environment placed at 20h nl PSP. (Zero offset assumed.) Set segment to zero il parent's environment is to be inherited.

> DWORD Pointer to command line image to be placed at 80h in the Program Segment Prefix

(PSP). DWORD Pointer to File Control Block (FCB) to be placed at 5Ch in

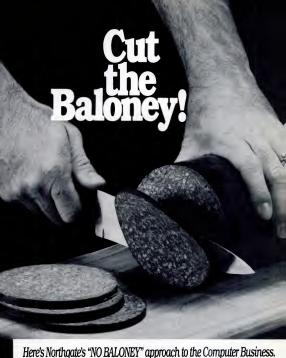
06h

0Ah

the PSP DWORD Pointer to second FCB to be

placed at 6Ch. Figure 3: The parameter block pointed to by ES:BX when AL=O (load and execute) in the

EXEC function call.



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LOG Command

Jeff Prosise Purpose:

1988 No. 21 (Utilities) A memory-resident utility that automatically maintains a record of computer activity, which can assist you with

Format: Remarks LOG [filespec] [/U]

Entered without the optional filespec parameter, LOG opens a file named USAGE.LOG in the root directory of the current drive. The user may override any or all of the drive, path, and filename defaults by supplying the desired parameters as the filespec option when LOG is initially run. Although it can be executed from the DOS prompt, LOG is normally loaded by being included as a line in an AUTOEXEC BAT file. Barring conflicts with other memory-resident programs, LOG can be uninstalled by executing the command with the /U parameter.

maintaining tax records, client billings, and use-analysis.

After listing the date, LOG files provide the start, end, and elapsed times for each program that is executed. The program name and any parameters entered with it are also logged, as is the "level" of DOS activity. At the first DOS prompt, the DOS command level is 0; a program running under DOS is at level 1; invoking a secondary copy of COMMAND.COM by shelling out from the program to DOS represents level 2, and so forth. LOG can track up to ten levels of DOS activity. Time spent at the DOS prompt is identified as <idle>. LOG does not record the use of internal DOS commands (DIR, CD, and REN, for example), or command calls that fail ("Bad command or filename"). LOG produces pure ASCII files that can be TYPEd to the screen or to a printer or used with a browse utility or text editor.

Available for downloading from PC MagNet (see the sidebar "LOG by Modem"), LOG.COM is already compiled and ready to run. LOG.BAS will automatically create LOG.COM when run once in BASIC. Creating LOG.COM from the LOG.ASM source code requires the use of a macro assembler (1BM or Microsoft, Version 2 or later) and the following commands:

MASM LOG; LINK LOG;

EXE2BIN LOG LOG.COM

UTILITIES

gram (usually COMMAND COM) has just been temporarily suspended. When execution returns to it, the program that was originally EMECHE end soft. Every time an event occurs, LOO writes a single line of information to the big file pertaining to dure OPENFILE is used to open the log dure OPENFILE is used to open the log write the log entry; and CLOSETIC write the log entry; and CLOSETIC closes the open log file. LOG records the program ended and the new one began.

DOS 3.0 introduced function 59h, which allows programs to request extend-ed error information from DOS when a function call fails. With DOS 3.1 came the new (but undocumented) function 5Dh tastfunction 6Ah, for setting extended error information. Function 5Dh takes as a parameter (in DS:DX) the address of an array of 8 words. These represent, in order, the states of the AX, BX, CX, DX, SI, DI.

DS, and ES registers upon return from

function 59h. Since LOG uses DOS functions to open, close, and write to a log file after an EXEC call is made but before passing control back to the parent process, any extended error information generated by the EXEC call will be lost unless preventive measures are taken. If LOG detects that it is running under DOS 3.1 or later, it preserves the extended error information stemming from EXEC, by obtaining it with function 59h and performing its file I/O calls. It then restores the error information with function 5Dh. Extended error information passed back from the EXEC of DOS 3.0 or earlier is unavoidably lost.

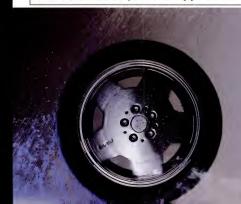
REENTRANCY CONSIDERATIONS
One of the complexities in dealing with
EXEC is that in versions of DOS before
Version 3.0, a call to EXEC could return
with all registers except CS and IP destroyed. LOG saves all remaining registers

except SS and SP on the stack, then stores SS and SP in the code segment. On return, the two stack registers are restored and the values that were pushed onto the stack before the EXEC call was made are popped

off into their respective registers.

Caution must be observed there for obvious reasons. Register values can't be opposed off the stack until after SS and SP are reset. Easy enough, But we can't jet so disguate a single memory location SS and SP and set them saide there. Since EXEC calls can be nested several levels deep, the subroutine DOSINT in the LIGO source code (which intercepts a chief in the LIGO course code (which intercepts a chief in the LIGO course code (which intercepts a chief in the LIGO course code (which intercepts a chief in the LIGO course to the chief intercepts and the light intercepts and the light intercepts and the light intercepts are substantially renterable.

Reentrancy requirements dictate that any value that must be preserved and is unique from call to call must be assigned a unique storage address. Thus, two arrays of ten words each are set aside for SS and SP. As in the table of program names, the current level number is used to calculate an



offset into these arrays. If successive values of SS and SP were allowed to overwrite each other, LOG would bring the system to its knees the first time you shelled out to DOS and tried to return or ran a program that EXECed another pro-

High-level-language compilers ease the burden of writing reentrant or recursive subroutines by allocating local storage snace on the stack each time the subroutine is called. Assemblers do nothing of the sort. Programmers writing in assembly language must implement this or comparable logic by themselves.

FULLY QUALIFIED FILENAMES Since LOG is a TSR, one of its tasks during initialization is to convert any user-

supplied filespec for the log file into a fully qualified filename. The term "fully qualified" means that the filename is prefaced with an unambiguous drive specification and pathname that give it the same meaning to DOS no matter what disk and directory are currently being used.

The procedure GENSPEC is called to generate a fully qualified filename from a filespec that may or may not be fully qualified. GENSPEC also supplies the default USAGE.LOG filename if none was supplied by the user. GENSPEC then tests the drive and pathname it generates to make sure the filespec is valid and sets the carry flag accordingly just before it terminates. "Carry clear" on return means a valid filename was created; "carry set" means the input filespec was invalid

The process of generating a fully qualified filename is not trivial. The logic flow goes something like this: The current drive and directory are obtained from DOS and saved. If a drive specification wasn't given in the filespec, the default drive is requested from DOS and added to it: if one is given, the default drive is set as such. The path portion of the input string is extracted. the current directory is set to the one designated, and a full pathname is obtained from DOS through function 47h. Then the original drive and directory defaults are restored. For a more comprehensive discussion of this task, see Ray Duncan's Power Programming column "Keeping Filenames Fully Qualified" in the July, 1988,

issue of PC Magazine. For all its programming complexities, you'll find LOG to be a convenient and unobtrusive aid in keeping track of your computer usage. It is more suited to hard disk systems than machines equipped only with diskette drives, because it needs to access the log file every time a program is run and terminated. But at this stage in PC history, if you don't own a hard disk, you really should consider investing in one. The increase in productivity, to say nothing of the convenience, will more than offset the

Jeff Prosise is a contributing editor of PC Magazine.

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THE MOUSE: NOT JUST FOR WIMPS



Pointing devices aren't simply a concession to the Mac. They are part of a coherent approach to multitasking and reflect a recognition of the need for a graphics-centered user interface.

T'ver recently had a number of discussions on PC MagNet about the advent of the OS/2 Presentation Manager. I discovered that much of the opposition to environments like the Presentation Manager is focused on the mouse. And I must admit surprise at the number of passionate mouse-haters out there.

You've probably familiar with many of the objections. Some of them are valid, others are rather silly. Among the silly objections I would include: there's never any room on the desk for a mouse, it gets burned to the property of the objections, and so forth. (it's furney board—a much larger input device—and the keyboard never gets buried.) A more substantial objection, of course, is that sure inghe mouse requires moving one of your hands away from the keyboard. Yet, to concleyptiss of the have the same objection to the objection of the objection of the objection of the objective objective of the objective objective of the objective objective of the objective objecti

tion to function keys and cursor keys.

But I get the impression that many PC users feel—at least subconsciously—that the mouse is for wimps. In short, real computer users don't use mice.

pair users out to see more.

Although exes invented at Although expendent for decidedly unwinny systems, the device has come to be closely identified with the Apple Macintosh. That may be the core of the problem. Certainly there have been some interesting and powerful application programs developed for the Mac, but many PC users still regard it as a toy. The IBM PC is viewed as a read computer because its opcined to the computer because its opsomething vaguely revolting about copying files from one disk to another using only the mouse.

I understand this attitude because I've been there myself. But I've come to like the mouse, and I now recognize its importance to the future evolution of the PC. How will you recognize the Presentation Manager power users of the next decade? By the little critter on their desks.

RECOMMENDED, NOT REQUIRED Of course, if you really don't want to use a mouse with the OS/2 Presentation Manager, you don't have to. The Presentation Manager gives you freedom of choice. All the standard user interface objects (such as menus, dialog boxes, buttons, and so forth) have a keyboard interface as well as a mouse interface.

When Apple originally designed the Macintosh, it could afford to make some very radical design decisions because the

■ The PM gives you freedom of choice. All the standard user interface objects have a keyboard interface as well as a mouse interface. operating environment and hardware (including the mouse) were bundled into one package. The original Mac keyboard did not have cursor keys, and the mouse warrequired for many system functions. (The more recent Mac keyboards, however, have cursor keys, indicating Apple's sensible recognition that the best design is often one that gives users flexibility.

The situation with the OS2? Presentation Manager is quite different. This is an operating system and environment that is designed for existing hardware. Unlike the PS2S, the Pc AT and XT Model 286 (both of which can run the Presentation Manager) do not have built-in mouse ports, and IBM does not even sell a mouse for these earlier machine.

Programmers who develop applications for Microsy Niedov have been accuse from the environment itself and often case from the environment itself and often provide a full keybourd interface that allows their programs to be used without a mouse. (For some applications, however, such as CAD and desktop publishing varies—this becomes subward and unfeasible, so these programs often require a mouse for full functionality.) I suspect that many of the Presentation Manager programs will be similarly designed.

Light pens, joy sticks, and track balls are all alternatives to the mouse; they can be used with the Presentation Manager if a degroenic considerations of mouse use will someday indicate that the pointing device should be part of the keyboard itself. I hate to suggest that IBM redesign the keyboard vet again, but that may be required.

■ ENVIRONMENTS

But I would rather not get into a discussion of mouse ergonomics here. Let's examine instead why a pointing device is useful in an environment like the Presentation Manager, and why it is therefore, nearly inevitable.

THE MOUSE AND MULTITASKING What? you ask. What on earth does the mouse have to do with multitasking?

A lot, actually. To examine the relationship between the mouse and multitasking, let's think about the different ways that a multitasking environment on a personal computer can allow a user to run multiple programs and switch among them. I think of these facilities as the user interfaces to multitasking.

Perhaps the most primitive approach is submitted background processing. This is supported under OS2. 1.0 and later with the DEFACH command. If you run a program from the CMD. EXE prompt and precede the command line with the word DETACH, the prompt will return immediately and the program will run in the background. Generally, you first redirect program output to a file and then look at the file when the program is finished.

The DETACH command is a fairly traditional facility. In the days when I programmed in PL/I on an IBM 370 from a 3278 terminal, I used a similar command called SUBMIT. Under Unix, you run a program in the background by following the command line with an ampersand (&).

We can call this the "delegation" mapler, You're sessually led ling the computer, "To 0 this job. Don't ask me any questions about it, Just do it. I'll look at the results when you're done." While back ground processing it fine for some jobs ground processing it fine for some because it eliminates interaction between the user and the program. As applications have become more interactive, submitted back-ground processing has become much less useful.

More useful to many users than background processing is "context switching," the ability to switch from one program to another without ending the first program. Under DOS, the most familiar context-switching method is pressing a hottey that invokes a RAM-resident popup. This is not multitasking in the strict

sense, since the program undemeath the pop-up is suspended while the pop-up is suspended while the pop-up is a fairty. However, because the pop-up unsea a hardware interrupt (the keyboard) to interrupt one program and switch to itself, it certainly employs some multitasking techniques. As you know, pop-ups under DOS have many problems, mostly because

DOS offers virtually no support for them. In one sense, pop-ups are actually an extremely crude implementation of a windowing environment. They are crude because when the pop-up is displayed, you can't switch to the program undermeath the pop-up. Despite the fact that the underlying program is still visible on the screen, you must make the pop-up go away before

■ The windowing

environment encompasses all the other multitasking user interfaces and gives the user the most

•

flexibility.

the program becomes active again. This constraint gets worse if—as is sometimes the case—you invoke po-pu over po-pu por po-pu. To switch from one po-pu pot another, you have to back up through the po-pus, making each one disappear in the reverse order you invoked them. You should be able to simply switch from one pop-pu po another, but this would obviously require some sophisticated screen management that supports pop-pu windows.

Another user interface to multitasking implements the "virtual terminal" metaphor. This approach gives you the illusion of having several PCs on your desk and moving from one to another. Virtual terminals are supported under OS/2 1.0 and later and also under some 80386-based operating systems that make use of the 80386's virtual-86 mode to multitask DOS programs.

Under OS/2, you can have multiple

"sessions" (sometimes called screen groups), each of which runs a full-screen program. You can flip through these sessions using the Alt-Ese to bring up the session manager that lists all the sessions. You then use the keyboard (or mouse) to select one.

I think anyone who has used OS/2 1.0 for some period of time will agree both that running multiple sessions is very convenient but that it can become somewhat confusing and difficult. Often what you want is the ability to merge two sessions in such a way that they appear side by side on the same screen.

For that, we move to the "desktop" metaphor implemented in the OS/2 Presentation Manager. In the Presentation Manager, multiple programs run in windows on the same screen in the same session. (Of course, OS/2 1.1 still supports multiple sessions as well)

I see windowing environments such as the Presentation Manager as the optimum user interfaces to multitasking. The windowing environment encompasses all the other multitasking user interfaces and gives the user the most flexibility. If you want to run a program full-screen, you simply "maximize" the window. If you want to look at two programs side by side, you adjust the window sizes and position the windows appropriately. If you want to run a program in the background and look at the results later, you "minimize" the program so it appears as a small icon at the bottom of the screen. Like pop-ups, these minimized programs are ready for use at

any time.

When you run multiple programs in windows under the Presentation Manager, only one program can be directly interacting with the user. This is called the "active" program or the window with the "input focus." That window occupies the foreground of the display.

So now the question arises, How do you switch control from one window to another?

One way is to use the same keystrokes you use to switch among sessions under OS/2 1.0. You can use Alt-Esc to paddle your way through all the programs. Ctrl-Esc invokes the Task Manager, which lists all the currently running programs. Then

you can use the cursor keys to select the one you want.

But in many cases when you want to switch from one program to another, you can see the desired program's window or icon on the screen. If the screen could respond to your fingers, you wouldn't use the keyboard at all. You would point at the program, as if to say "I want that one," just like ordering something at a sushi bar.

With a mouse, that's exactly what you do. When you click on a window, the window becomes active and moves to the foreground of the display. If the program is running as an icon at the bottom of the screen, you use a double-click (two clicks in quick succession) and the icon expands to a window.

Suppose you want to switch to another program and select an item on that program's menu. Using the keyboard, you must first switch to the program and then select the menu item (using Alt and a letter key, or Alt and the cursor keys). With the mouse, this becomes one operation. You simply click on the menu of the inactive program. The program becomes active and the menu item is invoked

If you prefer using the keyboard to do these things, that's fine. But when everything is laid out on a screen in various windows, pointing is more natural. You can't point with the keyboard.

And that's why the mouse is such a powerful accessory in a multitasking windowing environment. It provides an easier, faster, and more natural way to switch among programs.

INTERACTIVE INTIMACY Just as the user's interface to multitasking has evolved over the years, application programs have also evolved to become more interactive. Some of us can remember when an "input device" was a punched card reader and an "output device" was a stack of green paper. We've come a long way since those days.

The most primitive type of interactive computer medium is the teletype terminal. With teletype input and output, the keyboard provides a stream of characters and the output device (whether paper or a CRT) displays a stream of characters. A mouse makes no sense in such an environment. In fact, cursor keys don't even make sense. The cursor shows only where the next character will be displayed (which is right after the last character displayed). The only possible nonforward cursor movement is the backspace.

Only in a full-screen character mode environment does a set of cursor movement keys become necessary for moving the cursor around the screen and for performing other tasks.

Yet interaction has progressed beyond the point where the keyboard is adequate. To examine this, let's look at the implementation of one simple operation-changing the width of a columnunder three generations of spreadsheet programs.

 In a well-designed program, a mouse can become an extension of your fingers. You can touch, pick up, and stretch objects on the screen.

The first spreadsheet program was Visi-Calc. To change the column width in Visi-Calc, you selected a command from the menu and then typed in the numeric column width. Of course, this often required that you count how many columns you needed. Even then you might have had to adjust the column width several times before you got it just right.

In the most popular second-generation spreadsheet program (Lotus 1-2-3), user interaction has been enhanced. Not only can you type in a numeric value, but you can also use the Left and Right Arrow keys to decrease and increase the column width. This second approach is nice: you get immediate feedback as 1-2-3 changes the width of the column, and you can more quickly adjust it to the width you want. In a third-generation spreadsheet pro-

gram (Microsoft Excel), you don't even need to invoke a menu option to change the column width. Instead, you simply reach

up to the screen, take hold of the line separating the columns, and physically move it. Of course, you don't do this with your fingers. You do it with the mouse.

In a well-designed program, a mouse can become an extension of your fingers. You can touch, push, pick up, move, and stretch objects on the screen. The mouse gives you a more intimate relationship with the visual interface of the program. and hence, a more intimate interaction

with the program itself. Scroll bars are a handy visual device best suited to a mouse. They're most often used for applications that store a document (such as a word processing document or a spreadsheet) in memory and display only a portion of it in the window. The scroll bar slider indicates the approximate location of the portion in the window within the whole

document. Often the keyboard cursor keys duplicate some scroll-har functions, such as scrolling one line or one page. But with the mouse you can also move to a particular location in the document. For example, if you want to move to the middle of your word processing document, you use the mouse to pull the slider to the center of the scroll bar. This is much faster than repeatedly using the PeUp or PeDn keys until you reach the middle.

THE MOUSE AND GRAPHICS The OS/2 Presentation Manager is a graphical environment. There are a number of reasons for this.

The most obvious reason is that a windowing environment must accommodate both programs that use graphics and programs that display only plain-vanilla text. A graphics environment can handle both: a character-mode environment cannot.

The second reason may seem superficial, but it really isn't. Character-mode windowing environments are just plain ugly and don't make efficient use of screen real estate. For example, the various linedrawing characters are often used to draw boundaries around character-mode windows. But there's no way to have different colors on the two sides of the boundary line. Moreover, the horizontal line-drawing characters take up a whole character row rather than just one pixel.

The major objection to graphics, of

ENVIRONMENTS

course, is the speed degradation. The problem cannot be ignored, but I think it is only temporary. The next few years should see some major advancements in video adapter technology that will virtually eliminate the speed problem.

A graphical environment and a mouse get along together very well. Not only does the mouse work better in a graphics mode, but graphics applications benefit from the mouse.

Using a mouse in character mode is nearly intolerable because the mouse pointer moves in a very jerky manner as it

 Graphics-oriented the specification of precise locations on the screen. With a mouse this is fairly easy.

jumps among discrete character cells. In graphics, the mouse pointer moves smoothly from pixel to pixel.

Graphics-oriented programs (such as CAD or desktop publishing) often require the specification of precise locations on the screen. With the mouse, this is fairly easy. With the keyboard, it's not. Although a program can attempt to emulate a mouse using the cursor movement keys, the results are usually not satisfactory. To obtain the same amount of precision you'd need to move the cursor one pixel per keystroke. Furthermore, even if the program moves the cursor more than one pixel on typematic repeats, it still takes a long time to get the cursor from one side of the screen to the other. In contrast, you can move a mouse pointer very quickly

Let's face it: the keyboard is essentially a character-mode-input device. When the computer industry graduated from a teletype environment to a full-screen character-mode environment, keyboards had to accommodate this change by including cursor movement keys. The evolution to a



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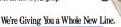
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■ ENVIRONMENTS

graphics environment benefits from an additional form of input quite different from the keyboard: the mouse.

THE MOUSE AND MESSAGES In a conventional environment such as DOS or OS/2 1.0, an application program that reads user input from both the keyboard and the mouse must be structured differently from a program that reads only the keyboard.

Many DOS programs that use only the keyboard spend much of their time in the BIOS interrupt 16th function call foll waiting for a key to be pressed. But if the program also uses a mouse, it can't do this because it will miss mouse input.

The interrupt 33h mouse interface for DOS was first introduced in the Microsoft mouse device driver and was later adopted by other manufacturers of pointing devices. A program can handle both keyboard and mouse input by alternately checking interrupt 16h for keyboard input and interrupt 33h for mouse input. But it can't wait for this input. The program must instead poll the keyboard to see if any key is available. If not, the program then polls the mouse to see if any mouse activity has occurred. If not, then it's back to the keyboard, and so forth. (Michael J. Mefford's FONTEDIT program in the Utilities column of our September 13, 1988, issue shows how this is done.)

snows now this is once. This is fine for a DOS program because DOS is a single-tasking environment. But under a multitasking environment such as OS-2, it becomes intolerable. If there is no keyboard or mouse input, the program is still eating up CPU cycles checking for input. This degrades performance in other programs running under the system. Therefore, an OS2 program mass use a different technique to read both keyboard and mouse input.

OS2 has two sets of application program interfaces for the mouse. The first interface is part of the OS2 kernel and cossists of a series of functions with the Mouperfix. This interface is for programs running in full-screen sessions and not for the Presentation Manager programs. To avoid the problem of polling for keyboard and mouse input, the program must create a second thread of execution. The program waits for keyboard and waits for keyboard and waits for keyboard input in one thread and

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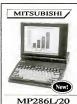
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ENVIRONMENTS

mouse input in the other.

Of course, the use of multiple threads of execution certainly complicates the structure of a program. It would be much nicer if keyboard and mouse input were delivered to the program through the same interface; that is, the program should be suspended in just one function waiting for any input event. When the program gets the input event, it can then determine whether it represents mouse or keyboard input and process that input appropriately.

In other words, a much better interface for reading both keyboard and mouse input is a messaging system. And guess what?

 A better interface for reading keyboard and mouse input is a message system, which is the input model for the OS/2 Presentation Manager.

That's the input model on which the OS/2 Presentation Manager is built.

As I've discussed in previous columns, the Presentation Manager stores keyboard and mouse input (along with some other messages) in a message queue. The program retrieves these messages and processes them in a window procedure. Information that accompanies the message tells the program what the message is (that is, whether it represents a keystroke or mouse activity or something else) and other information necessary for the program to process the message (such as the keyboard character itself or the mouse pointer position).

With a messaging system, processing of input from multiple sources becomes a snap.

A COHERENT ENVIRONMENT So we see now that all these characteristics of the OS/2 Presentation Manager-the use of windows for multitasking programs on a single screen, the increased use of inter-

active visual devices such as scroll hars and buttons, the graphics, the messaging system that informs a program of input, and the mouse support—are all connected. Take away any one of these elements and

you're left with a weaker--nay, a wimpier-environment.

In the next Environments column, I'll discuss how the OS/2 Presentation Manager programs process mouse messages.

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MASM STRING AND SORTING ROUTINES



This issue concludes the series on C-equivalent assembler routines by adding case-insensitive search and compare functions and by giving you a MASM Ouicksort implementation.

The last two Power Programming columns have been devoted to those found in the C nuntime thirmy. My objective has been to provide you with a cert of simple things block that can be of simple processing requirement in a MASM splittant of the sissue, we'll finish the series on strings with two more functions, the move on to other matters. A complete list of all these routines, together with the seaso in which each appears, it shown in

MASM STRING PACKAGE #3 The issing STRINGSJ.ASM (Figure 2) is the source code for our third and last package of string routines. It contains two public routines, STRCMPI and STRINDAX, and one building block routine, STRUPAX is STRUPAX is mean only for use within the package; it is not a public string routine, and so it cannot be referenced from other

STRCMPI is a case-insensitive string comparison routine with the following parameters:

DS:SI	=	string1	address
BX	=	string1	length
ES:DI		string2	
DX		string2	length

The result of the comparison is determined by the first difference found between the characters in the two strings, with case being ignored for the characters A-Z and a-z. If the first differing character in stringl is stringl is less than string2. If the strings are of different lengths but contain identical characters up to the end of the shorter string, then the shorter string is considered less than the longer string. To illustrate,

"ABC" is less than "ABC"
"ABC" is less then "ABCD"
"abc" is equal to "ABCC"
"abc" is less than "ABCD"

The results are returned in the CPU's Z (Zero) and S (Sign) flags, as follows:

Zero) and S (Sign) flags, as follows:

Thus, after calling STRCMPI to compare two strings, a program can test the results by executing a conditional jump (such as JL, JE, or JG), just as it would do after comparing 2 bytes or words. STRCMPI preserves all registers and the original

strings.

STRNDXI is a case-insensitive string search routine. Its arguments are

DS:SI = pattern string address
BX = pattern string length
ES:DI = text string address
DX = text string length

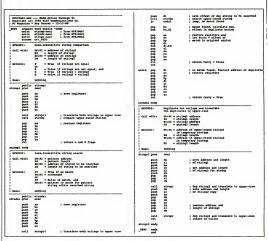
STRNDXI searches the text string for the first occurrence of the complete pattern

MASM String Functions

Function	Description	Module	PC Magazine issue
STRBRK	Searches for character	STRINGS1.ASM	November 15, 1988
STRCAT	Concatenates strings	STRINGS2.ASM	November 29, 1988
STRCMP	Compares strings (case-sensitive)	STRINGS1.ASM	November 15, 1988
STRCMPI	Compares strings (case-insensitive)	STRINGS3.ASM	December 13, 1988
STRDUP	Duplicates string	STRINGS2.ASM	November 29, 1988
STRLWR	Lowercases string	STRINGS2.ASM	November 29, 1988
STRNDX	Searches string (case-sensitive)	STRINGS1.ASM	November 15, 1988
STRNDXI	Searches string (case-insensitive)	STRINGS3.ASM	December 13, 1988
STRSPN	Validates string	STRINGS1.ASM	November 15, 1988
STRUPR	Uppercases string	STRINGS2.ASM	November 29, 1988
STRXLT	Translates string	STRINGS2.ASM	November 29, 1988
STRXTR	Extracts string	STRINGS2.ASM	November 29, 1988

less than the character in string2, then | Figure 1: The PC Magazine issues in which MASM Power Programming string functions appear

■ POWER PROGRAMMING



Flaure 2: STRINGS3 ASM is the source code for the case-insensitive string search and comparison routines.

string, so the pattern string should always be shorter than the text string. Case is ignored for the characters A-Z and a-z, so all of the following cases would find a match:

If no match is found, STRNDXI returns the Carry flag true (1). If there is a match, STRNDXI returns the Carry flag false (0) and ES:DI points to the first character of the matching sequence within the string being searched. Both the registers (other

than ES:DI) and the original strings are unchanged.

The building block routine STRUPR2, which is called by both STRCMPI and STRNDXI, "duplicates" the two argument strings and then folds the lowercase characters in both strings to uppercase consecutive and the string to the string that the original STRCMPI and pass the results back to the original caller. Of course, because of the overhead involved in character copying and translate

ing, STRCMPI and STRNDXI are many times slower than their case-sensitive counterparts STRCMP and STRNDX.

counterparts STRCMP and STRNDX.
Warning: in its present form,
STRUPR2 calls STRDUP (from
STRINGS2.ASM) to make the string duplicates. This means that the longest string
STRCMP! and STRNDXI can handle is
governed by the size of the ring buffer in
STRINGS2.ASM. (STRCMP and
STRNDX, which search or compare
strings in place, do not share this limitation.) If you need to compare or search

own memory by calling MS-DOS inter-

STRNDXI will help to convince you of the

benefits of modular, structured MASM programming. Three columns ago, you might have found the idea of writing a

case-insensitive string compare or string

search routine that left the original strings

unaltered a tiresome and messy assign-

ment. As you can now see, however, once

the proper building blocks are in place the

job is almost trivial. We already have case-

sensitive compare and search routines,

string duplication, and string translation

routines in hand, each of which is small

enough to be easily comprehended, so it

becomes a simple problem of putting them together in the right order.

rupt 21h function 48h. I hope that study of STRCMPI and

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one-touch menu execution of any strings longer than 255 bytes, you should DOS program without conflict or modify the buffer size in STRINGS2 memory overhead .ASM or rewrite STRUPR2 to allocate its Disk Services

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STRINGS3.ASM DEMO The program TRYSTR3 in Figure 3 demonstrates the use of the STRCMPI and STRNDXI routines. It prompts you for two strings, compares and searches them, and displays the results. To terminate the demo program. just press Enter alone in response to the "Enter string 1" prompt, or press Ctrl-C or Ctrl-Break at any time.

In order to build TRYSTR3.EXE, you need the files listed below. Refer to Figure I for the issues in which they are to be found. Put all these files in the same directory and enter the following commands to assemble and link them:



If you don't want to trace through the demo program with CodeView, you can omit the /Zi and /CO switches. If you prefer to automate the process of creating TRYSTR3.EXE, you can use the Make

file shown in Figure 4. Because the STRCMPI and STRNDXI routines have quite different uses, you should concentrate on one at a time when using the demo program and ignore the results returned for the other one. It takes a fairly unusual pair of strings to get useful information from both functions at the same time!

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■ POWER PROGRAMMING

REVISITING QUICKSORT In the Dower Pogramming columns of September 13 and 27, 1988, I discussed the Quicksort algorithm and presented simple Cand MASM implementations that sorted arrays of integers. I also mentioned powerful C runtime library function quort (), a "sorting engine" that can work on arrays of any kind of data given a suitable comparison function. I will not rehash how Quicksort and

qsort (. . .) work here; please refer to the previous columns for details.

to the previous columns for details.

QSORT.ASM, shown in Figure 5, is a similar sorting engine for use in MASM programs. It sorts arrays of any kind of data in place, providing you supply an appropriate comparison routine. Its parameters are

DOTS ATC

Dist = addrase of first array alement
Dist = addrase of last array alement
AX = lacgth of much array alement to bytes
EsiEx = addrase of comparison routine

QSORT returns all registers without changing them.

The comparison routine is entered by a far call from QSORT, so it must be declared in your application program with proc far. QSORT passes it the following parameters:

DB:SI = address of let item to compare ES:DI = address of 2nd item to compare CX = length to compare

cx = length to compare

The comparison routine must return regis-

	teht (o)	MASH String Fa 1988 Siff Commun	lostions Co.		mov int	ab. 4fb	standard output handle function ##h = write transfer to MI-008
DC No.	exine *	Ray Duncas: * 12-	13-00		III.		ost second string
	404	646	ASCII carriage return	-	MOY	dx,offeet DGBOUT	str2 ; address at beffer
ř	900	fab	: ASCII lice feed		MOT	08,64	maximum entry length
	-4-				MOT	hx, atdin	standard input handle
rdin.	9072		s standard input handla		BOT	ab, 3fb	function lfh - read
dont	101	i	s standard output handle		int	21h	transfer to MM-DOS
tderr	401	3	standard error handle				
		-		4	aub	ax, 2 a21 so, ax	seve string langth
CHOCUT	erous	DATA			BOY	ezien, ax	
					BOY		compare the strings
DATA	request	word public 'DAT	A*		BOT	he, miles	combata cue acctuda
					BOY	di.offest str2	
tr1	40	88 dep (8)	; string 1 buffer		BOY	ds, e2lse	
tr2	45	88 dup (8)	s string 2 buffer		call	etromal	
llen	dw		s string 1 length		call	sfles	format # and #
llen	de		string 2 length				fines for output
ral	db	or.lf.lf. TRoter	and a decided a		call	megle, al eflag eegld, al	
191	00	or, at, at, "Enter	accrud 11 -	1	-	seald.al	
Çı_le	6 equ \$-	medi		1			
-	dh	14		1	MOT	al.offeet strl	search string 2
192		er,lf, Enter str	Log 21 *	1	BOY	br.ellmn	for string 1
24 18	o equ \$-	1074			BOY		
-	db			1		de, e2les	
43	db db	er,1f, "string 1 "77776", or,1f, "S "77778", or,1f,1f	act .	1	Se11	etredal	
93a 93b	OD.	""""", CT, 11, "S	tring 4 act -	1			
1936 1936	do	*7 8** ,eg, 1t, 1t	'.aimwell ea.	1	call	oflag	forwat CT flag
193d	db.		ar. ar.a	1	BOT	menle, al	for output
6636 632	dia.	"7", or, 1f, "street					
100	40	*22220*			BOT	ax, di	format string 2
	n equ (-						pointer for output
					call		
ATA	ende						dispiny results
					BOT		
TEST		word sublic 'con					
	autro.	atrompi mear					standard output handle
	BETTE	etrodxi.pear					function 40h - write
	RETER	(tob.mear					transfer to MS-DOS
	*****	ON 1 TEXT, da : DORO					
						mainl	
.in	2070	Dear					
	Pr. con	LIVE CO.		mein	endo		
	BOY	AM. DATA	make our date engment	Janes			
		de, ex	addressable	sting	proc		check state of Sero flag
							return AL - 'T' or 'T'
					MOT	al, "P"	
	BOY		: formet etring 1		jex	sflagi	
						al, "T"	
	call	itoh	for output	aflagle	rat		
				1			
	wor.	aw offeet str?) format string 2	efleg	endo		
		bx,offest meglo	toffer address	efleq	prec	Dear	check state of slem flag
(41 -	call	itoh	: for output	efleg			check state of sign flag return AL = 'F' RT 'F'
int:	cell	itoh	; for output ; display promot for string 1	efleg	mor	el.***	check state of slgm flag return AL = 'F' mr 'F'
int :	0811	de, offset puncur	; for output ; display prompt for string 1 seed ; address of message	efleg	mov ine	el. "F"	check state of sign flag return AL = 'F' mg 'F'
dat :	mov mov	de, offset puscur me, megi_lan	; for output ; display prompt for string 1 'seepl'; address of message ; lampth of message ; resident output handle	,	nov jes	el.***	check state of sign flag return AL = 'F' ng 'F'
inl;	0811	de, offmet pumour me, meet lan be, stout ab 450	; for output ; display prompt for string 1 'seepl'; address of message ; lampth of message ; resident output handle	efleg efingl:	nov jes	el. "F"	check state of sign flag return AL = '9' nr '2'
int,	mov mov mov	ds, offmet numour ms, megl lan bs, wtdout ah.48h	; for output ; display prompt for string 1 'seepl; address of message ; lampth of message ; standard output handle ; function 48h = write	afing1:	mov jne mov ret	el. "F"	check state of sign flag raturn AL = 'F' ng 'F'
int :	mov mov mov	de, offmet pumour me, meet lan be, etdoüt ab, 40h 21h	; for output ; display prompt for string 1 reed; ; address of message ; lampth of message ; standard output handlm ; fanotion 48b = write ; transfer to MS-DOS	afingl:	mov jne mov ret	el. "F"	obeck state of sign flag ; return AL = 'F' RT 'F'
int:	mov mov mov lat	de, offmet numour ne, megl lan he, stdoüt ah, 40h 21h de, offeet numour	; for output ; for output ; display prompt for string i ;eegl; saddress of message ; standard output handla ; function (8h = write ; transfar to ms-oom ; get first string ; get first string ;	ofingle	mor jne mor ret andp	al, T	return AL = 'F' mg 'F'
int	mov mov mov let	de, offset pusour ma, megi lan ba, etdoüt ah, eth 21b de, offset pusour ma. 64	; for output ; for output ; display prompt for string 1 ;eeg1; address of message ; length of message ; length of message ; for output ; function 48h = write ; function 48h = write ; transfer to HE-DOS ; get first string **strl ; address of boffer **strl ; address of boffer	afingl:	mov jne mov ret andp	al, Tr eflegi al, Tr	peters AL e 'F' Er 'F'
int	mov mov mov let	de, offset pusour ma, megi lan ba, etdoüt ah, eth 21b de, offset pusour ma. 64	; for output ; for output ; display prompt for string 1 ;eeg1; address of message ; length of message ; length of message ; for output ; function 48h = write ; function 48h = write ; transfer to HE-DOS ; get first string **strl ; address of boffer **strl ; address of boffer	ofingle	mov jne mov ret andp	al,-r- eflegi al,-r-	return AL = 'F' mg 'F'
int	mov mov mov let mov mov let	itch de,offmet numcur ne,megl lan be,etdoüt ah,46% lib de,offeet numcur ne,64 bx,etdin bx,etdin	; for output; j for output; j dupley prompt for string 1 respl; saddress of message; j standard output bandls j standard output bandls j standard no sm-dos j get first string set1; saddress of buffer j saxious satty langth; j standard laput bandls	ofingle	mov jts mov ret andp pree	al, -y- efiest al, -y-	peters AL e 'F' Er 'F'
int	mov mov mov let mov mov let	itch de,offmet numcur ne,megl lan be,etdoüt ah,46% lib de,offeet numcur ne,64 bx,etdin bx,etdin	; for output; j for output; j dupley prompt for string 1 respl; saddress of message; j standard output bandls j standard output bandls j standard no sm-dos j get first string set1; saddress of buffer j saxious satty langth; j standard laput bandls	ofingle	mov jos mov ret andp proc mov jos	al. Tr efieti al. Tr	peters AL e 'F' Er 'F'
aint :	mov mov mov let	de, offset numbur ne, megi lan he, etdoüt ah, 48h 21h de, offset numbur ne, 64 bu, etdin ah 21h	; for output ; for output ; display prompt for string 1 ;eeg1; address of message ; length of message ; length of message ; for output ; function 48h = write ; function 48h = write ; transfer to HE-DOS ; get first string **strl ; address of boffer **strl ; address of boffer	ofingle oflag	mov jns mov ret andp proc nov jnc	al, -y- efiest al, -y-	peters AL e 'F' Er 'F'
aint :	mov mov mov lat mov mov mov mov mov mov	de, offset number ne, megi lan be, widolft ab, 40h 21h de, offset number ne, 44 be, widdin ab, 37h 21h	; for output ; for output ; display groupt for string 1 ; display groupt ; largely for sessing ; largely for sessing ; largely for sessing ; largely for sessing ; standard output handla ; fanction (sh. = write ; standard output handla ; fanction (sh. = write ; set first string ; string to the string ; fanction left set first string ; first loss string ; first	ofingle	mov jns mov ret andp proc nov jnc	al. Tr efieti al. Tr	peters AL e 'F' Er 'F'
int;	osili mov mov mov let mov mov mov mov mov mov mov	itch de,offmet puncur ne.megl lan be,artdolf ab,48b 21h de,offeet puncur ne.64 bx,stdin ab,3fb 21h ax.2	for output for string 1	efingl:	mov jes mov ret andp proc mov jes mov ret	al. Tr efieti al. Tr	peters AL e 'F' Er 'F'
int	mov mov mov lat mov mov mov mov mov mov	itch de,offmet puncur ne.megl lan be,artdolf ab,48b 21h de,offeet puncur ne.64 bx,stdin ab,3fb 21h ax.2	; for output ; for output ; display groupt for string 1 ; display groupt ; largely for sessing ; largely for sessing ; largely for sessing ; largely for sessing ; standard output handla ; fanction (sh. = write ; standard output handla ; fanction (sh. = write ; set first string ; string to the string ; fanction left set first string ; first loss string ; first	ofingle oflag	mov jns mov ret andp proc nov jnc	al. Tr efieti al. Tr	peters AL e 'F' Er 'F'
ist:	mov mov mov lat mov mov lat mov mov mov mov mov mov mov	de, offmet pumour na. megl lan ha. stdoff ah, eff al, eff as, eff bu, etdin ah, etdin	of context (dupley prompt for string 1 (dupley prompt for string 1 (string prompt for	efingl:	mov jes mov ret andp proc mov jes mov ret	al. Tr efieti al. Tr	peters AL e 'F' Er 'F'
int:	osili mov mov mov let mov mov mov mov mov mov mov	de, offmet pumour na. megl lan ha. stdoff ah, eff al, eff as, eff bu, etdin ah, etdin	for output for string 1	efingl:	mov jes mov ret andp proc mov jes mov ret	alT- efieji alT- coar coar	peters AL e 'F' Er 'F'
inte	mov mov mov mov let mov mov let mov mov let mov let	de, offmet pumour ne. megl lan be, stdoöt ab, 40% 216 de, offeet pumour na. 64 bz, stdim ab, 37% 21b. ax, 2 allan, ax mein2	of content	ofing: ofleg ofleg: ofleg:	mov jos mov ret andp proc mov jec mov ret endp ends	al, "F" coar al, "F" coar al, "F" of lag1 al, "7"	oback state of Carry Flag paturn AL = 'F' or 'F'
int	cell mov mov mov let mov let mov let mov let mov jex	de, offmet pumour ma. meet lam ba. meet lam ba. metodit ab. defa control contr	of the content of the	ofing: ofleg ofleg: ofleg:	mov jos mov ret andp proc mov jec mov ret endp ends	al, "F" coar al, "F" coar al, "F" of lag1 al, "7"	oback state of Carry Flag paturn AL = 'F' or 'F'
	mov mov mov mov let mov mov let mov mov let mov let	itch de, offmet pomour ne, megl lam be, stdolft ab, 48h de, offeet pomour ne, 64 bx, stdin ab, 3fh 21h ax, 2 silmn, ax main2 ax, 4698b	of the content of the	ofing: ofleg ofleg: ofleg: cfleg _TEXT	mov jns mov ret andp proc mov jso nov ret endp ands mov de	al, "F" coar al, "F" coar al, "F" of lag1 al, "7"	oback state of Carry Flag paturn AL = 'F' or 'F'
aint:	cell mov mov mov let mov let mov let mov let mov jex	itch de, offmet pomour ne, megl lam be, stdolft ab, 48h de, offeet pomour ne, 64 bx, stdin ab, 3fh 21h ax, 2 silmn, ax main2 ax, 4698b	of the content of the	ofing: ofleg ofleg: ofleg:	mov jos mov ret andp proc mov jec mov ret endp ends	alT- efieji alT- coar coar	oback state of Carry Flag paturn AL = 'F' or 'F'

Figure 3: TRYSTR3 ASM provides an interactive demonstration of the routines contained in Figure 2.

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ters DS:SI and ES:DI unchanged, though | with the following arguments: it may destroy registers AX and CX withif item 1 - item 2, 8 - True
if item 1 < item 2, 5 - Felse and 8 - True
if item 1 > item 2, 5 - Felse and 8 - True out causing any problems for QSORT. The result of the compare operation must be returned to OSORT in the Z and S flags | QSORT is recursive and makes heavy use | of eight or ten calls when sorting reason-

of the stack. It requires at least 24 bytes for each invocation (possibly more depending on the compare routine supplied by the caller), and it may easily recurse to a depth

```
trystr3.obj : trystr3.sem
masm /Ei trystr3;
strings1.obj : strings1.sum
masm /Si strings1;
                                                                                                                   itoh.obj : itoh.sem
masm /#i itoh;
strings2.obj : strings2.sem
mesm /fi strings2;
                                                                                                                   trystr3.exe : trystr3.obj strings1.obj strings2.obj\
    strings3.obj itoh.obj trystr3
link /co trystr3+strings1*strings2*strings3*itob;
strings3.obj : strings3.sem
```

Figure 4: A Make file for creating the TRYSTR2 EXE demonstration program.

Control Cont								
Cold							be,si gmorti	: while(j > i) : (do until poietere crose)
Cold colds Cold cold cold cold cold cold cold cold c	I PC No	peeine .	Ray Duncas: • 12	-13-88		ache	bu.dl	: 81 = 1, 01 = 1, 30 = right
### 15 - 4 deletes of the Lorent Form **STATE CONTROL AND STATE C		dibi	74:41 a adfraga	of first (ten to east		207	ce,itemeis	
## 1 - Supply of any of the company	,						****	A news can trac excuration
			ss:ss - address	of compare routine	1	ache	be,di	: mt = i, bt = right, mm = j
Section Sect	;			44 and 1440	1	cell	es,itemie	s not partitioning alament into position
The content of the	Peter	301	enthing					
The content of the	, Deee:		enthing			push	e1.	; save 1
Column C	i					BOT	di, ei	/ quort(left, 1-1)
### A STATE OF THE PARTY OF THE	I the e	PERFORM A	compare routies	ares be decision se .bioc ret.			di,itemale	
The content of the	1		DE:EL - sources	of let item to compare			ha.compare	
1	!		seibl - eddress	of 2nd item to compare			ax,itemaio	
	i It mu	rt retur	n Dies Teret a	I unchanged and the regult		e+11	d+05.g	
	; of th	compar	icon in the CPU	flege ee follows:		pop	ei.	r qeort(i=1, right)
The content of the						a440	al,itemale	
The state of the s			8 - 7, 8 - 7 LE	itme 1 > item 2			bs.compare	
The control of the co	2412	*******	word sublic ton	ra:		BOY.	ms,itemate	
March Marc		****	COL TEXT, do: NOT			*****		
Column C						pep	dx	; restore registers
The parts of the p		#01 #01	though per lob-e	: bytes per item		pop	**	
A			(bp-0)	; first itse to eart		500	ei.	
Second S	STARC	+41	(89-18)) lest frem to sout			**	
### deads per dead				; make visible to Linker	1	200		
	quest	proc	Dear			Pob		
		сир	41,01	; if right <= left	maners.	-		r return to caller
		500	geort5) just ealt				
		push	bp	; set up stack frame		endp_		
		100*	bg.+g	; end local variables	ESCS		eachatge two	items
		push	**	; seve ediform of	1 . ~ 11	with	20.07 - 1000	es of first iten
		bosp	he) compare routine	1			
					1 :		CB - 1100	length
		posh	di	; offset last item	Bets	1807	nothing	
		pueb) save remaining registers				
		puek	da					
			44	, sake data addressable by	each	proc	Dear	
		pop	••	; He for eschange routine	1	cmo	ce.2	are items worder
			-1 (1	1 87 - 1 - 1eft - 1		jee	eech1	; ee, jump
							en cett	. Items are words
		207	bx, di	r au - j - right		achq		s eachange them quickly
	georti:			r scen right for item >= partitioning value		200	[d1],++	
		edd	el,itemais	1 1++	1			
1 1 1 1 1 1 1 1 1 1				: while(items[1] < items(right))	each1:	bear		1 sens sourcess
1		11	quort2		1		-	
1	******			seam left for item or partitioning value	ench2:	207	al,[di]	; eachange items
Secretary and Company of the Company	******		ei,itemaio					1 4744 47 4744
Company Comp		CMP	ei,left	: While(items()) > items(right)				
control contro		BOY	ce, itemais) as () > seed		inc	di.	
		cetl						
quartit simby he,di 37 c 3,00 m i. Mar right pri					1	bob	45	; restore addresses
real each ; exchange the items sche ei.di ; ff = 1, or = 1, ax = right TEXT ends	quort4:	neby	he.ds	; st = j, 0t = i, ax = right		tar.		
real each ; exchange the items sche ei.di ; ff = 1, or = 1, ax = right TEXT ends		-	co.itemale					
		ceil	exch	; exchange the items		-		
		wrhe	et di	. St = 1. St = 1. Az = right	TEXT	ende		
		actig	di,he	st - 1, 0t - right, se - j		eed.		

Figure 5: Given an appropriate comparison routine, QSORT-ASM sorts arrays of data using the Quicksort algorithm

■ POWER PROGRAMMING

ably large arrays. Your application program should therefore have a stack of no less than 4K to provide for a margin of safety.

A DEMONSTRATION OF QSORT
The program TRYQSORT.ASM (Figure
6) illustrates the use of the QSORT.ASM
sorting engine. TRYQSORT prompts you
for as many as 25 items, calls QSORT to
put them in order, and displays the sorted
list. Again, the program may be terminat-

ed by pressing Enter alone at the first prompt or by hitting Ctrl-C or Ctrl-Break at any time.

TRYGSORT is really two demonstration programs in one. It can process either strings or integers; you select which by setting the equates STRINGS and SINGLES to TRUE or PALSE at the beginning of the source file. Needless to say, both should not be set to TRUE at the same time! Conditional assembly statements throughout the remainder of the source file cause een-

eration of the appropriate code for the type of data you wish to enter, sort, and display. The routines COMPS (compare strings) and COMPI (compare integers) provide examples that will show how to write comparison routines that can be called by

To build the TRYQSORT.EXE demonstration program, you will need the following files: TRYQSORT.ASM (Figure 6), QSORT.ASM (Figure 5), ATOL.ASM (from Power Programming, February 16,

OSORT.

1							1
; TRIQO	ORT.ASK	Demonstration	of MASH Quicksort		MOT	be, ixi	; put date into errey
1 Cobar	light (c)	1980 Siff Commo	elcations Co.		ebi.	bx,i	; (item mamber * 2)
) PC No.	gasize *	Hay Duncan + 12	-13-00		BOY	word ptr (berite	mel.ex :
					endif		1
true	400	1					
falms	equ	•			if	strings	; if strices version
			art two equates control the demo type rue for integer demo, false for string demo rue for string demo, felse for integer demo		BOY	ex,ixi	; calculate array offset
Siegles Strices		false set t			MOT	dx,itemais	; for entered string
					1mu1	dx	
esetio					mov add	dx, ax	
stdout	+91		; standard input handle				; DG:DR - array address
stderr		1 2	standard octput handle		BOY	co,itemaia	; CE - max input length
					BOY	bx,stdie	ax = hardle
er	+01	4-D	: ASC11 carriage reture		BOY	ab, 3fb	Fan 3FH - road
116		tel	ABCIT Line ford		int	21h	transfer to MS-DOG
	e-qu						
		strings			CMP	ax, 2	y was anything entered?
		ection.	: bytes per string item		je endir	melo3	
	endif						1
	If	einnica					
Itemals	A4	+75-31++	- bearing our frage of the con-		ine	word ptr inl	; count items stored
T-commerce	endif		; bytee per leteger item				; and don't exceed maximum
1					CMD	word ptr ixt,e_i	Come
+ (tems		25	; man items to sort	minte	1me	maio2	; get another sotry
-114	-de	49) max reems to sort	maleJi			empty line entered
73.67	******	word public 'co	001		-	word ptr 181,0	; any date in array?
	as from	ce: TEXT. de: DA					; no, jest exit ; otherwise sort data
	extro	Itoerteer			BOY		: DS:S1 - first item
	ertro	atolinear				ea.ial	Object - fact item
					dec		
					BOT	di itensia	
mein	proc				imai	di	
					BOY	di, ax	
	MOV.	de. Ex	; seke our date segment ; addrassable		-44	di, ei	
					807		: ES:BX - address of
	cld		string one eafety first		BOT	bo, TEST	compare routies
naiole					if	eingles	
			; initialize array indee		BOY	ba, offest compi	
	push		: force 80 - data segment		andif		
	200				if	strions	
						he offest compe	
	TOR		1 initialine data array		andif		
	BOT	ox, (o_items*ite			BOY	aw.itemsia	AX - bytes per item
	MO.E.				cali		
	rep sto						; display sorted date
			; display "Enter xxx to sort"		BOY	word ptr int, 6	
	BOY	dx,offset meg1					display "Nore are the serted xxx" Dice - message address CE - message legeth
	BOY	co,seçi_lec	; CR - message langth		BOY	ds.offeet mag2	
	BOY	hu, stdout	; BX = handle		BOY	co.mse2 iso	
	MOT.	ab, 46b	Fan 462 - write		BOY	be etdout	IX - bandie
	int	21b	; transfer to MS-DOS		BOY		Fan 462 - write
meinte		ax. ixt	convert item number to ASCII string		Les	21.5	transfer to MI-DON
	BOY		1 1-besed item mumber	nele4:			
	ine	ax	: address for stries				
	cali	hx,offeet megle	: address for string : convert it		BOY	48, 582	1 i-based item number
	CHIL	B100C	1 consets 72		lec		
			display item number		BOY	bx.offest seels	address for string
	BOY	dx,offset meg3	; DG:DE - massage address		call	h2ded	CONVERT IT
		ox,mag3 leo bx,etdoüt	1 cx = 100dcu				
	BOY	Da, a toout	; BX - hardle				: display item number
	int	ab, 46h 21h	Tun 462 - write transfer to MS-pos		BOY		
	THE	41n	Transfer to MS-DOS		BOY		
	TE.	singles	; if integers version		BOY		
			read keyboard setry		Bev	sh, 49b	: Pan 46E - write
	107	ax, arrest ibuff	1 DE IDE - Imput buffer		int	21h	I tracefer to MM-DOM
	BOY	ce, ##	CX - mex input iongth				
	BOY	he, etdin	BX = handle		1.0	sincies	If integers version
	Lot	ah, 3fh 21h	Fan 378 - read		BOY		
	100	ATP	Transfer to ME-DOS			bre. 1	
					BOY	ax, word ptr (be-	items) 1
	omp 10	an, 2 main3	; was anything entered?				
	,-		i anded vrest sere				CONVERT date to ASCII
	BOY		convert imput to		BOY	00,10	i nee pres 10
	1140	atoi	; binary in req. ax		BOT	el, offeet obuff	s address for string
			, ,				

Figure 6: TRYQSORT ASM provides an interactive demonstration of the QSORT sorting engine. The COMPS (compare strings) and COMP1 (compare integers) routines provide a model for suitable string and integer comparison routines, respectively.

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- too next to letter A.
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■ POWER PROGRAMMING

1988), and ITOA. ASM (February 29, | 1988).

You must put all these files together in the same directory and enter the following series of commands:

HASH /Zi ATOI; HASH /Zi ITOA; HASH /Zi QSORT; HASH /Zi TRYQSORT; LINK /CO TRYQSORT+QSORT+ITOA+ATOI;

cell

Alternately, you can use the Make file that is shown in Figure 7 below to automate the process of building the executable pro-

gram, TRYQSORT.EXE.

I recommend that you test your understanding of the OSORT routine by modifying the TRYOSORT demonstration program for double-precision integers. You will need to add a new equate, called DOUBLES, at the beginning of the TRYOSORT source file, appropriate conditional assembly statements, calls to ATOL (February 16, 1988) and LTOA (February 29, 1988) to convert input strings to binary double-precision integers and back again, and a COMPD routine that

OSORT can call to compare two double-

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precision numbers. Once you have worked through this interactive demonstration exercise successfully, you should be able to apply QSORT to any of your future sorting needs.

THE IN-BOX Please send your comments and suggestions to me at any of the following e-mail addresses:

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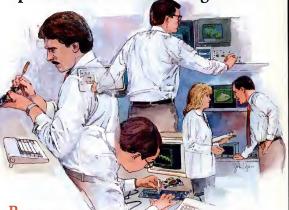
BIX: rduncan

display integer CX = string lengt DS:DX = string as DX = handle FXm 488 = write transfer to 38-00 ; returns result in flags irings version lists errey ad - arrey elem scan for string and word public 'mara' etringe 'Enter etringe to sort.. er,18 vance through arra strings 'Ners are the sorted strings...' ; final exit to MS-DOS or,lf, ltem ' convert himary value 6-99 to decimal ASCII chare. call with AL " himary date, BI = addr. for 2 char ax, [al] (Figure 6 ends) atoi.obj : atoi.asm masm /zi atoi; tryqsort.obj : tryqsort.asm masm /Si tryqsort; itos.obj : itos.asm manm /Si itos; tryqsort.exe : tryqsort.obj atoi.obj itoa.obj qsort.obj link /CO tryqsort+qsort+atoi+itoa;

Figure 7: A Make file for producing the TRYQSORT.EXE demonstration program

ort.obj ; qsort.asm mam /£i qsort;

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SPREADSHEET CLINIC



Locate misspaced labels in 1-2-3; alter the date format of your Framework worksheet; return to 1-2-3 from DOS using a batch file; delete leading zeros from values in 1-2-3 worksheets.

Entering the date in ddmmyy format into the current cell of your Framework worksheet

As a military user of Framework, I need to represent dates in military format (ddmmvv). Unfortunately. Framework does not have a function that displays dates in this way. So I developed a library macro that, when invoked, enters the date in military form where the cursor/cell pointer is positioned within the current document. For example, if the current date is June 15, 1988. Framework will type 15 June 1988. when you invoke this macro.

To build this macro, create a new Empty/Word frame. While the border of the frame is highlighted, assign this frame the name {Alt-D}. Next, press F2 to access the formula area of the frame, type the formula

@performkeye(@mid(@dete)(@today),5,@len
(@dete)(@today))-10];
@performkeye(@mid(= ",1,1)),
@performkeye(@mid(@dete)(@today),1,(@len
(@dete)(@today))-(=0]en(@mid(@dete)
(@today),5,@len(@dete)(@today)-1=10]))))
@performkeye(@mid(@dete)(@today),1])

and hit Enter. Finally, move the formulacontaining frame into the Macros subframe of your Library frame.

Since the frame that contains this macro is named {Alt-D}, you can invoke this current date, prefaced by a 'character) into

macro simply by typing D while depressing the Alt key.

The first line of the formula enters one or two digits for the current date. The second line types a single space character. The third types the full name of the current month, plus a space character. The last call types the four-character representation of the current year .- John Friedson; APO, New York

The most interesting part of this macro is that it extracts the full name of the current month from the beginning of the result of the @date4(@today) function. This portion of the formula is complex because Framework lacks a function to return the

location of a substring within a string. In Lotus 1-2-3, Symphony, and Quattro, you could use the macro shown in Figure I to enter the string form of the current date in military form. Cell B1 of this macro

School (Shorth (Show), ", "January", " "Februery", "Harch", "April", "May", "June ", "July", "August", "Geptember", "Gotober", "Stovember", "Dovember", "A" 405TRING [1988-6TRAIN] (B)]

contains the statement

When you invoke this macro, 1-2-3 places the result of the second argument of the {Let} statement (the military form of the the cell named NEXT (B2), Since cell B2 is the next cell in the macro, 1-2-3 then types its contents into the cell on which the cell pointer is positioned at the time.

Stripping leading zeros from worksheet entries in Lotus 1-2-3

1-2-3 always places a zero to the left of the decimal point of positive values that are less than I and negative values that are greater than -1. For example, if you type .123 into a cell and press Enter, 1-2-3 will display that value as 0.123. Similarly, if vou enter the value - .123, 1-2-3 will display it as -0.123.

Since the sales people in our company found this irritating, I developed a way to suppress the display of this character. I operated upon each value with a formula such as

@REFEAT(* ",9-@LENGTH(@STRING(cell,digits)))
40!1(@LEFT(@STRING(cell,digits),2)=".0",
60!I(@LEFT(@STRING(cell,digits),2,2,-"),
61!(@LEFT(@STRING(cell,digits),1)="0",
68!ILEE(@STRING(cell,digits),2,1,-"),
68!ILEE(@STRING(cell,digits),8,1,-"),

where "cell" is the cell's address that contains the value upon which you want the formula to operate, and "digits" is the number of digits that you want to appear to the right of the decimal point. The result of this formula is the string form of the value upon which the formula operates, stripped of a leading 0 and padded with spaces so that it is aligned with the right edge of its cell. This formula assumes that the cell into which you enter it is nine spaces wide. which is a cell's default value in 1-2-3

Cell A1 of the worksheet shown in Fig-

Figure 1: This macro enters the label form of the current date in ddmmyy format into the current cell of a 1-2-3, Symphony, or Quattro worksheet.

■ SPREADSHEET CLINIC

ure 2 contains the value .123. As you can see, 1-2-3 displays this value as 0.123. The formula

81: GREPEAT(* ",9-GLENOTH(GETRING(A1,3)))
401F(GLEFT(GETRING(A1,3),2)="-0",
GREPLACE(GETRING(A1,3),8,2," -"), GREPLACE(GSTRING(A1,1),1)="5",
GIF(GLEFT(GSTRING(A1,1),1)="5",
GREPLACE(GSTRING(A1,1),5,1," "),
GSTRING(A1,1));

in cell B1 strips the leading zero from this value. Specifically, it returns the string (shown here in quotes) " .123' (note the five leading spaces). Because column B is nine spaces wide, the number 3 is aligned with the right edge of cell B1.

The first part of this formula returns five space characters-the number required to align the rightmost character in the formula's result with the right edge of a nine-space-wide cell. The second call returns the string ".123"-the string form of the value in cell A1, stripped of its leading 0, with three digits to the right of the decimal point. Concatenating this string to the series of spaces produced by the first part of the formula produces the nine-character string " .123"

Cells B2..B3 contain similar formulas that act upon the values in cells A2..A3. As you can see, these formulas correctly convert negative values, such as the one in cell A2. For values that do not have a leading zero, such as the one in cell A3, these formulas return the string form of the original value, with three digits to the right of the decimal place.-Richard Ruiz: Toronto, Ontario, Canada

These formulas work well in cells that are nine spaces wide (the default for a 1-2-3 worksheet). However, the results of these formulas will not be aligned with the right edge of the cells if those cells have a width other than nine spaces. To make sure that the results of these formulas will be aligned with the right edge of the cells that contain them, no matter how wide those

Figure 2: The formulas in cells B1 .. B3 of this worksheet strip the leading zeros from the values displayed in cells A1. A3.

cells are, replace the first part of the second argument of the @REPEAT function (the value 9) with the function

@CELL("width", (cell2) where cell2 is the address of the cell in the

column into which you are entering the formula. Preferably, this should be the address of a cell other than the one into which you are entering the formula. Otherwise, a circular reference will result.

Productivity Tip

To begin executing a 1-2-3 macro starting in the current cell, invoke the macro (Dispatch @CELLPOINTER("address")}. The single command in this macro instructs 1-2-3 to branch to the cell over which the cell pointer is positioned at the time.

Returning to 1-2-3 from DOS using a hatch file

In the April 26, 1988, Spreadsheet Clinic column, Michael Kran and others described different ways to keep the message "(Type Exit and press [RETURN] to return to 1-2-3)" on the screen after using the /System command in order to access DOS from within 1-2-3. Although interesting and clever, these methods are more complex than they need to be.

Presumably, the reason for keeping this message on the screen is to prevent a user from loading the program on top of itself by inadvertently typing 123 instead of Exit. 1 prevent this from happening by changing the name of the file 123.COM to ABC. COM using DOS's RENAME command. Then, in the same directory that contains my 1-2-3 files, I create a batch file named 123.BAT that contains the following commands:

exit

To create this batch file, I make the directory that holds my 1-2-3 files the current directory and enter these commands: COPY CON 123.BAT

exit abc^z

Enter Ctrl-Z ("Z) by holding down the Ctrl key and tapping Z. Then press Return again to complete the creation of the file.

Once you have created this batch file, you can load 1-2-3 as you normally would: make current the directory that contains your 1-2-3 program files, type 123, and then press the Enter key. Instead of reading the file named 123.COM, however, your computer will read the batch file 123.BAT. Since you are at the DOS level, your computer will ignore the first statement in the file. However, the second statement, abc, will call the file ABC .COM, which loads the program.

Now, suppose that after loading 1-2-3 you use the /System command to access DOS. If you type Exit when you are ready to return to 1-2-3, as you should, you will return. If you type 123, however, your computer won't load 1-2-3 on top of itself. Instead, it will execute the batch file named 123.BAT. The first statement in the file, exit, returns you to 1-2-3. The second statement, abc. gets "lost," Consequently, your computer will not reload 1-2-3 automatically after you invoke the /Quit Yes command to exit.-Johnathan Hirst: Brooklyn, New York

If your only concern is to make sure the user doesn't reload 1-2-3 on top of itself. we recommend Mr. Hirst's method over the ones presented in the April 26, 1988, issue. However, if you're not sure that the user will remember that Exit is the command required to return to 1-2-3, then you'll probably want to use one of the methods presented in that issue.

Expanding a 1-2-3 range does not change its reference—but this is not a bug

In your December 22, 1987, issue, Kevin Gaza described the way that 1-2-3 deals with references to single-cell ranges that you expand into multiple-cell ranges. Although Mr. Gaza's description of 1-2-3's behavior is correct, his categorization of that behavior as a bug is not.

Mr. Gaza's concern was with functions that can accept range arguments. If one of these functions references a single-cell named range and you expand that range to

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■ SPREADSHEET CLINIC

encompass more than one cell, 1/2.3 will not expand the argument of the function. Instead, the function will reference the same said cell for designating the cell for the function of the cell for the function of the function of the function of the function of COUNT(TEST). If you expand TEST so that it encompasses cells AL 1.A.3, cell AS will no longer contain the function of COUNT(TEST). Instead, it will contain the function of COUNT(TEST). Instead, it will contain the function of COUNT(TEST).

While this behavior may not be what you would want for most functions, it is essential for maintaining the integrity of formulas in the worksheet. To understand why, suppose that cell A6 in the worksheet described above contained the formula +TEST*5. If 1-2-3 acted as Mr. Gaza would want it to, this formula would become the equivalent of +A1..A3+5. which is a formula that 1-2-3 cannot accept. Of course, the formula actually becomes +A1+5. The only difference between this formula and the original is that this one references cell A1 by address rather than by name.-Lance Lide: Little Rock, Arkansas

We appreciate Mr. Lide's insights into this behavior. It would be nice if 1-2-3 could determine which range references should be expanded and which should not. But that's a lot to ask, even from a software package like 1-2-3.

Find misspaced labels by executing the /Range Labels Right command

More than once I've had to look down a long column of labels to find those that end with one or more trailing spaces. To do this, I used to move the cell pointer down the column one cell at a time. While the cell pointer was on each cell, I'd press the Edit key to bring its label to the Edit line. The position of the cursor on that line indicated whether or not the label contained once or more trailing space characters.

Fortunately, there's an easier way to check for trailing spaces in a column of labels. First, set the width of the column to a few spaces wider than the longest label in the column. Then, issue the /Range Labels Right command, highlight the entries you

want to check, and press Enter. The labels without trailing spaces will now be aligned with the right edge of the column, but the labels with trailing spaces will not.

labels with trailing spaces will not.

Similarly, I occasionally need to search
a column of right-aligned numeric labels to
find entries that were inadvertently entered
as values, or vice versa. Formerly, I did
his by moving the cell pointer down the
column one cell at a time. looking for the
sheence of a label prefix on the first line of
the Control Panel. However, there are faster ways to identify these inappropriate ener ways to identify these inappropriate en-

First, you can decrease the width of the column to one space. When you do this, 1-2-3 displays each of the value entries as a single asterist. However, one or mele terrs or leach of the label entries will be visible. Alternatively, you can assign a nuele terrs of each of the label entries will be visible. Alternatively, you can sisting a number of the collection of the collection. After you do this, the value entries will be displayed in the format you selected but the appearance of the labels will not change.—Richard L. Alikhus; Renton, Washington

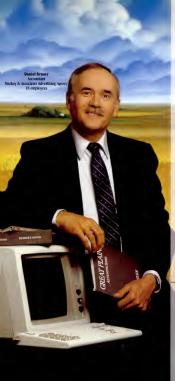
We'll add these to our list of 1-2-3 techniques. As in this case, the most useful 1-2-3 techniques are often the simplest.

Productivity Tip

Password, a \$19.95 utility program from Vericomp Publishing, searches encryptom 1-2-3 and Symphony worksheet files for the password that was used to encrypt them. This program is a must for anyone who has forgotten the password they used to encrypt an important worksheet file. To order a copy of Password, call (619) 277-0400

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User-to-user

Perform repeated operations easily by assigning a text string to a single keystroke combination; better your DOS environment and batch files with ANSI.SYS.

Enhance your DOS environment and batch files with ANSLSYS

The earliest computer monitors were little more than electronic teletype machines. And, just like a teletype, they'd print one character at a time until the end of the line, then advance to the start of the next line. In this age of pop-up windows and pull-down menus, that teletype action seems primitive, but it's the way most DOS commands and many utilities work.

and many unines work.

Later video terminals added control codes. These codes move the cursor, erase areas of the screen, and generally control the display. You can add this kind of control to your batch files and DOS environment using ANSLSYS.

Before you try to install ANSI.SYS, make sure it is in the root directory of your boot disk. Then add this line to your CON-FIG.SYS file:

DEVICE=ANSI.SYS

Now reboot your computer. You won't notice any immediate difference, but AN-SI.SYS is at your command.

GIVING ORDERS TO ANSI To send
ANSI SY's a message, you write an ecape sequence to standard output. An escape sequence is a coded string of charactests beginning with ASCII character 27,
the Ese character. Here we run into a problem; it's difficult to ECHO the Ese character. Yet, to experiment with ANSI SY
you uneed an easy way to send it messages.
ANSI COM
TO this end I'm providing ANSI COM. ANSI SY.

This tiny program accepts a character string on its command line, replaces every tilde (*) character with an Esc, and writes it to standard output. For example.



can generate flat ASCII files. TED, a small, full-screen editor in PC Magazine's November 15, 1988, Utilities, is ideal for this purpose. Make sure you include the blank lines after the RET instruction and after the final Q. With DEBUG

N ANSI	.COM
A 100	
MOV	SI,0082
MOV	CL,[SI-02]
JCXZ	0117
DEC	cx
LODSB	
CMP	AL,7E
JNZ	0110
MOV	AL,1B
XCHG	DX, AX
MOV	AH, 02
INT	21
LOOP	0109
RET	
RCX	
18	
W	

Figure 1: This DEBUG script generates ANSI.COM, a tool to communicate with ANSI.SYS. .COM in the current directory or available on the path, give the command DEBUG < ANSI.SCR

Watch the output—if you see * Error pointing to a line, double-check that line in ANSI.SCR, fix it, and repeat. Try your new ANSI.COM with the examples above or create your own. You can use any ANSI sequence as long as you replace the Esc with a tible.

ANSI Color Commands

Parameter	Effect	
0	All off (low-inter	esty white on black
1	High intensity	
4	Underline on (r	onochrome only)
5	Blittle on	
7	Reverse video	
8	Invoble	
Color	Foreground	Background
Black	30	40
		40
Red	31	
Green	32	42
Yellow	33	43
Blue	34	44
Magenta	35	45
Cyan	36	46

Figure 2: ANSI color commands take the form ESC[#; ...;#m, where each # represents a number from the list above.





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USER-TO-USER

ANSI Cursor Commands Cursor direction Backward ESC(#D Forward ESC[#C ESC(#B Down Uр To row column ESC(#,#H To row column ESC[#,#f ESC(2) Clear screen Ernen to FOI ESCIK Save cursor position ESC[s Restore saved position

Figure 3: The # symbol represents an optional parameter that determines how many times the command will be repeated. For example, ESC | 3C moves the cursor forward three characters. It defaults to 1

You won't find the ANSI commands in your DOS manual unless you're using an old version of DOS. Figures 2 and 3 provide a brief listing of the handiest commands, ANSIBOX, BAT, shown in Figure 4, demonstrates what you can do with these ANSI commands in a batch file. The first ANSI command prints "X marks the spot (X)" and saves the current cursor position. The next three commands write a vellow-on-red box with vellow-on-black text inside it. Then the last line comes back to the previous cursor position, turns off all color attributes, and finishes that line. With ANSI.COM you can beautify all your batch files.

Productivity Tip

When you're entering a lot of numbers on an old-style keypad, it's annoying to have to turn NumLock on and off to switch be-

tween the arrow keys and the numeric keypad. Just set NumLock to the state you use most and toggle with Shift.

Productivity Tip

To remove the Ctrl-Z from the end of a text file, use

COPY FILENAME+,,/B To restore the Ctrl-Z, use

COPY FILENAME+ ..

Don't do this to a nontext file, as it will truncate the file at the first Ctrl-Z.

Execute repetitive operations with a single keystroke combination

To perform repeated operations with a single keystroke combination, I created ANSIKEY.BAT shown in Figure 5. To assign a text string to a key combination,

AMBINET PS (text of key setting, up to 8 words). For example.

ANSIKEY F1 CD\DOS\DBASE\DRAWINGS will set function key F1 to execute

CD\DOS\DBASE\DRAWINGS

when you enter Shift-FI. To store the key settings, I create ten files, F1.KEY through F10.KEY. List the key assignments stored in these files by using ANSIKEYL.BAT in Figure 6.

The .KEY files must be initialized at startup via ANSIKEYI.BAT, shown in Figure 7, which I execute within AU-TOEXEC BAT. All three batch files-ANSI

KEY.BAT, ANSIKEYL, BAT, and ANSIKEYI.BAT-require that AN-SLSYS be installed. To do this, move AN-

```
ECHO OFF
ANSI X marks the spot (X) [s
     15:27H-141:33:1m
ANSI [6;27H] [40m HERE IS TEXT IN A BOX [41m]
ANSI -[7;27H
ANSI "[u"[@m... and here we are back at the spot.
```

SI.SYS into your root directory and add this line to your CONFIG.SYS:

DEVICE=ANSI.SYS

Within ANSIKEY.BAT, I use ANSI .COM to send the appropriate command to ANSI.SYS. For function keys FI through FI0, I send the scan codes 84 through 93.

This same technique could be used to assign values to other keystroke combinations. I have chosen Shift-F# because it seems to be a key combination that's less used than Alt- or Ctrl-, for example.

This technique saves me a substantial amount of time, and it uses only standard MS-DOS commands.—Patricia Hayes; Port Hope, Ontario, Canada

The submitted ANSIKEY.BAT file relied on the PROMPT command to send key redefinition strings to ANSI.SYS. As a result, it wiped out the existing prompt.

* DEALER INQUIRIES WELCOME

ECHO OFF IF NOT "%9"==" GOTO TOOMANY GOTO %1 GOTO ERROR

:F1
ANSI ~[0;84;"%2 %3 %4 %5 %6 %7 %8";13p
GOTO OK

:F2
ANSI "[#;85;"%2 %3 %4 %5 %6 %7 %8";13p
goto ok

:F3 ANSI "[0;86;"%2 %3 %4 %5 %6 %7 %8";13p GOTO OK

GOTO OK :F4 ANSI ~[0;87;"%2 %3 %4 %5 %6 %7 %8";13p

GOTO OK :F5 ANSI "[8:88:"%2 %3 %4 %5 %6 %7 %8":13p

GOTO OR

ANSI "[#;89;"%2 %3 %4 %5 %6 %7 %8";13p

ANSI [@;98;"%2 %3 %4 %5 %6 %7 %8";13p

To save the prompt, I fixed ANSIKEY so Figure 5: ANSIKEY.BAT makes assigning text strings to keys easy.



USER-TO-USER

ANSI "[8;91;"%2 %3 %4 %5 %6 %7 %8";13p GOTO OR :F9 ANSI "[8:92:"82 %3 %4 %5 %6 %7 %8":13p GOTO OK :F18 ANSI "[8;93;"%2 %3 %4 %5 %6 %7 %8";13p GOTO OF :TooMany

ECHO. Key setting text can contain at most 8 words. GOTO DONE

+ERROR ECHO SYNTAX: "ANSIKEY F# [text of key setting, up to 8 words]" GOTO DONE :OK

ECHO \$1 \$2 \$3 \$4 \$5 \$6 \$7 \$8 > \\$1.KEY DONE

(Figure 5 ends)

ECHO OFF

ECHO Key assignments for shifted function keys REH "COPY ... CON > NUL" hides any "File not found" messages FOR %% IN (1 2 3 4 5 6 7 8 9 18) DO COPY \F%% KEY CON > NUL

Figure 6: ANSIKEYL BAT lists the current key assignments made by ANSIKEY BAT.

it uses the ANSI.COM program instead. Any command you create with ANSI-KEY will automatically have a carriage return added to it. If you don't want that carriage return, remove the three characters ; 13 from each ANSI command line.

ANSIKEY allows you only to assign text strings to shifted function keys. If you'd like to experiment further, you can use ANSI.COM to create other key reassignments. The syntax is

ESC[#:#:..#p ESC[#; "string"p

ESC[#; "string"; #; "string"p

The first number (#) is the ASCII code of the key you're redefining. If this number is 0, the second number is the extended AS-CII code of the key. The remainder of the command is the character sequence you want to assign to that key. This sequence can contain any number of quoted text strings and ASCII character numbers sens-

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■ USER-TO-USER

rated by semicolons. For example,

AMSI "[#:84;"DIR +.COM /W":13;"DIR +.EXE /W":13;

will set the Shift-F1 key to do first a wide directory of .COM files and then a wide directory of .EXE files.

ANSI key reassignments work only in programs that use DOS standard input and

> ECHO OFF ECHO F1 > \F1.KEY ECHO F2 > \F2.KEY ECHO F3 > \F3.KEY ECHO F4 > \F4.KEY > \F5.KEY ECHO F5 ECHO F6 > \F6.KEY F7.KEY ECHO F7 > ECHO F8 > \F8.KEY ECHO F9 > \F9.KEY

ECHO F10 > \F10.KEY Figure 7: ANSIKEYI.BAT initializes the .KEY files that track the current key assignments.

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output. There aren't many such programs these days, but the DOS command level itself, along with utilities such as DEBUG and EDLIN, are likely places to use them.

Productivity Tip

Here's a quick way to make a file's date and time stamp current. Use

COPY /B FILENAME+,,

This tells DOS to copy the file plus a null file (nothing between the commas) onto the original file. The result is a file whose contents are unchanged- but its date and time stamp is updated.

Productivity Tip

If your computer uses just floopy disks, you can stash your COMMAND.COM

file on a RAMdisk and you'll be able to save yourself some time.

The RAMdisk can be small-64K is plenty of space. In your AUTOEXEC BAT file, copy COMMAND.COM to the RAMdisk, and add the command

"SET COMSPEC=C+\COMMAND.COM"

(If your RAMdisk isn't C:, substitute the appropriate letter after the equals sign.)

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7.

POWER USER

Composing documents from previously stored paragraphs in WordPerfect; linking databases in dBASE III reveals a bug; editing and updating Microsoft Word macros easily.

Edit and update Word macros more quickly and easily with these two

Here are two macros that will help users of Microsoft Word, Version 4.0, edit and manage their macros. The first macro is very simple:

<esc>i<f1>

Type it as shown and then use <Esc>C to copy it to the glossary. I recommend the name (and control code to call it quickly) Mac-List '<Ctrl-M>L. Mac-List brings up a list of your macros and boilerplate, which is useful in itself, and is called on by the second macro.

The second macro is shown in Figure 1. I recommend you call it Mac-Edit and give it the control sequence "<Ctrl-M>E. Mac-Edit begins by creating a blank paragraph for macro editing. It then calls up the glossary list and asks you to select the macro to be edited. After you make your selection. Mac-Edit inserts the glossary entry into your text and warns you not to hit the Enter key until you've finished editing. When you hit Enter, the macro highlights the text, calls up the glossary list, and pauses for you to select the macro name to use for the edited macro. Finally, after you have selected a name. Mac-Edit finishes by copying the text to the glossary and deleting the text from your screen .- John Thomas Gillick; Brooklyn, New York

This is somewhat similar in concept to the macro-editing suggestion by James C.

<f18>chome>center>cleft>ctrl M>l
cPeuce SELECT MACRO TO BE EDITED: "

center>cfis>chome>
 Peuce EDIT MACRO TEXT - DO NOT USE ENTER KET UNTIL EDITING IS COMPLETE

cfilex(6x)sftxescxc(fi) Peuce SELECT MACRO TO BE REPLACED WITH EDITED MACROcenteryy(filexdel)

Floure 1: Mac-Edit will help you edit a macro that is already in your Microsoft Word glossary.

Beard (Power User, August 1988). One notable difference is that Mr. Gillick's mets-macro will help you find a poorly remembered name in the glossary and will insert it in the clitting screen for you. Another is that while Beard's approach used a second macro to store the macro name and then automatically swed the modified text back to the same name, Gillick's macro unsife for you to designate the macro name before saving. Both of these differences are desirable.

You may want to take the first half of Gillick's macro (through the second pause) and add it to the front end of Beard's macro. Or you may want to take just the first two lines of Gillick's macro (up through the insertion of the macro into the text) and use it.—M. David Stone

Beware of dBASE III bug when linking databases

dBASE III users should be aware that whenever SET RELATION is used to link two databases, the DELETED() status of the secondary database is ignored even if SET DELETED is ON. The following example illustrates the

problem that I am having:

Trinary fatheless compar.dbt
Field Field Seam Type
1 CONTROL Character 12
2 THEN

Record COUTEN I THE SEAT THE

In a program where CUST.DBF is indexed on the Custrum field and set into relationship under ORDER.DBF, a listing of Custrum, Item, and CUST->Name fields will yield the deleted record rather than "Harry."

Record# CUSTNUM ITEM CUST->HAME
1 18 Sammer Deleted Rec
2 28 Raile Mary

Do you know of any workaround for this problem?—Dave Bartholomew; Oakland, California

Since this example uses the SET DE-LETED ON command, I thought perhaps



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the problem could be solved by issuing

SET FILTER TO .NOT. DELETED()
instead. But both dBASE III and FoxBASE
continued to report the deleted secondary
record

Other than PACKing the secondary file to physically remove all records marked for deletion or writing a longer program that would not use the SET RELATION TO command (and one that would run much more slowly as a result), there is no workaround.

Interestingly, however, Clipper, dBXL, and Quicksilver all correctly ignore the deleted record and produce the proper results when either SET DELETED ON or

SET FILTER TO .NOT. DELETED()
is issued.—Brad Stark

A short, quick procedure to center text in dBASE III programs

The short CM (Center Message) procedure shown below is perfect for centering messages or text headings in dBASE III pro-

PROC cm PARA row,msg @ row,inT((86-LEN(msg))/2) SAY msg

grams:

To use CM, just include it in your procedure file. Then, when you want a message centered, use this syntax:

DO om WITH 24, "center this text"

CM accepts two parameters: the ROW() on which to issue the text, and the

message itself. The message can be a text string (as above) or any character-type expression. The centering shown here is based on an 80-character screen width, but CM can center lines for your printer as well; simply adjust the width from 80 to whatever print width you're using.—Ronald Pollit; Philadelphia, Pennsylvania

This quick Center Message procedure is a great time-saver in any program where appearance matters, and it works with any modern dBASE-language application. Naturally, the message must be no wider than the screen or print line you're using. Here are some variations on CM.

As written, CM does not CLEAR the row first, so if other text may already be on-screen, add the command

@ row, # before issuing the centered text.

To issue the message in a different color so it stands out more issue a SET COLOR

so it stands out more, issue a SET COLOR TO command before the message and SET COLOR back to standard afterwards. In fact, the CM procedure I use involves passing a third parameter to specify which color should be set.

With Clipper, I use both CM and the following UDF (User Defined Function):

FUNCTION of PARA mag len=INT((88-LEN(mag))/2) pad=REPL(" ",len) RETURN pad+mag+pad

Equipped with both a procedure and a function, you can center text in any programming situation.—Brad Stark

Productivity Tip

When you are copying or appending large databases in Clipper, you can tell how long you will have to wait for it to be completed by using the FUNCTION rec.sho listed below. The constant monitoring of your progress will cost you about 10 percent in speed, however.

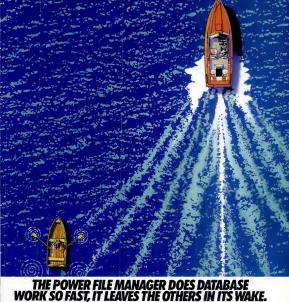
COPY TO <filsname> WHILE rsc_sho()
FUNC rsc sho
IF SUBS(STR(recn(),8),8,1)="8"
@ 24,8 SAY STR(recn(),8)

ENDI RETU .T.

Assemble documents from paragraphs stored as fields using WordPerfect's merge facility

We needed to be able to include multiple optional paragraphs in our legal documents. By using WordPerfect's merge feature, we were able to include user-selected paragraphs as the merge progressed.

We replaced the field number n in "Fn" with "C, added "O message" O, and combined it with "U to rewrite the screen. Thus, we've come up with a merge that



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'O «Teragraph #1> 'O This is the text for substitution paragraph number one
'R
'O «Teragraph #2> 'O PARAGRAPH MERGING:
This is the text for substitution paragraph number two.

*Als is the text for substitution paragraph number two.

'A Granagraph #3> 'OPARAGRAPH HEADING:

This is the text for substitution paragraph number three.

This is the text for substitution paragraph number three.

Figure 2: To create a secondary merge file for document assembly, structure it as above.

This is a primary document to test merging of optional paragraphs using Wordpurfact 6.2 or 5.8. $^{\circ}$ (97°C), nesert Perceptual 51 or 5) MRIP $^{\circ}$ (97°C).

orco

the above marge allows insertion of a paragraph with option 1 or no embetitation with option 5.

The above marge allows insertion prompts

1) insert Arrangel 61,

2) insert Arrangel 61,

20 1 20 21

"O'P'C?" The store marps ellowe insartion of aither paragraph 2_σ peragraph 3_σ or no substitution with option 3_σ

Figure 3: Merge this document with the DOC.SEC file shown above in Figure 2 to see document assembly using the WordPerfect merge feature.

stops, tells you which paragraphs are available, and selects your choice for inclusion in the primary document. Wherever you may need an optional paragraph from your secondary document, include this general form in your primary document:

^U^O message ^O^F^C?^

The message should include the number and description of each puragraph that might be used at this point. It will appear as a prompt in the primary document when the merge pauses for input, and it will disappear when the merge continues. The question mark (7) stops the insertion of a blank line when you select "no substitution."

WordPerfect displays control characters by putting a caret (*) in front of them, but you actually enter them by pressing Ctrl plus the letter. The very last character in the line is a real caret, however: press Shift plus the top-row 6 key. If the merge behaves strangely or stops,

examine the secondary document carefully for improper or missing merge returns ('R) or for either too many or missing carriage returns.—Robert Chestnutt and Connie Guhrt; Missoula, Montana

To try out this method in WordPerfect, Versions 4.2 or 5.0, type in DOC.SEC Park Avenue, New York, NY 10016

(Figure 2) and DOC.PRI (Figure 3). Enter the control characters using CrI plus the letter, or pick them from the Merge Codes menu, Shift-F9. Now clear your screen and perform the merge, with DOC.PRI as primary file and DOC.SEC as secondary file.

Note that in the primary file you must put a hard return between the end of the message and the 'O that follows it. If you omit the return, the "Field:" prompt will overwrite the message. You can create multiline prompt messages, as well—look at the second promot in Figure 3.

The number for the SKIP option can be any number larger than the maximum number of fields used. Also, you can insert any paragraph at any prompt—the message simply tells you which paragraphs are appropriate.—Neil J. Rubenking

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LANGUAGES



Finding ASCII text in .EXE or .COM files with Turbo Pascal; saving FORTRAN registers before calling assembler routines; recognizing multiple keystrokes in QuickBASIC.

A QuickBASIC function that recognizes multiple keystrokes

Programs that use PgUp and PgDn can be improved if you can move by more than one page at a time. This is often done by combining PgUp and PgDn with Ctrl to page in higher, fixed increments.

A better alternative to this is to count the number of times that the keys have been pressed while the Ctrl key is held down. This creates keystrokes such as Ctrl-PgUp-PgUp-PgUp, which can be interpreted to mean "Page up three pages." This could also be applied to graphics software that has a zoom capability. If Alt-Z means "Zoom two times," then Alt-Z-Z

could mean "Zoom four times," and Alt-Z-Z-Z could mean "Zoom eight times," and so forth.

FNGetKey\$ is a QuickBASIC function that implements this scheme (Figure 1). It works like INKEYS, but it returns an extra character containing a repeat count for selected combinations of keystrokes using Ctrl or Alt .- James A. Parsly: Knoxville. Tennessee

As with Inkeys, you would use the length of the string returned to determine if the key that was pressed was normal, extended, or repeated. Some text editors, such as SideKick, use a similar technique to avoid repeatedly updating the screen. If you press and hold Ctrl-PgUp in SideKick, it

senses that you want to span several screens and waits until you are done. Then, it redraws the screen only once.

This function can be converted to work with Turbo Basic without much effort: Turbo Basic supports calling DOS and BIOS interrupts directly.-Ethan Winer

A better way to copy and delete in Turbo Pascal

Mr. David A. Johns gave examples of some useful programs in the Turbo Power User column, PC Magazine, April 14, 1987. His Copy and Delete programs worked well, but I found them inadequate. I've developed versions with runtime error

works like meurs, but also returns a repeat count for extended keys. FTC GetKeyS, Seascodet, Heakt, Countt, Inhrrayt(1), Outhrrayt(1) DM Inhrayt(7), Guthrrayt(7)

Ney5 = IMERTS 'get a hayetroke brings = GetKey5 Exist OF 'det up default return value LEGICOULAPS) C-2 THEN EXIT OFF 'if cell or second key, exit es + ASC(RECOVES(SWIREYS, 1))

'ectel-Fi> through ectel-Fife 'ectrl-teft>, cttrl-Hight>, cttrl-End>,

*cctr1-repsy "Mait for additional keystrohes until the user sither releases the "Galt' or «Ctrl' bey, or hits a different keystrohe.

'Call the BIOS to get the status of the <aLT> and <CTRL> keys CALL INTO (4815, VARFTH(Inarrayh(S)), VARFTH(OUTATTSYN(S)))

'Check the appropriate bit is the AL register.
If (Mask's AND Outhrray's 81) = 8 0000 Done

ill the BIOS to see if there is a keystroke waiting in the buffer. Inarreyt(8) - 6H166 CALL INTSG(4H16, VARPIN(Inarreyt(8)), VARPIN(OutArreyt(8)))

ock the B flag in the FLACS register to see if a keystrohe is waitin one the hypercole from the heyboard boffer and increased the co gg = leaving to the county to the c

Hey! - Pacethey! IF Rey! - "" GOTO L2

CASE 1 CASE 1 PRINT Rept; CASE 2 PRINT "Scan Code: "; ASC(MIDS(Rept, 2)); CASE 2

Flaure 1: A QuickBASIC function that distinguishes multiple keystrokes.

LANGUAGES

checking and a display of what occurred during their execution. The programs are

listed in Figures 2 and 3. When I want to use one of these programs, I \$Include it at the top of the program I'm working on, for example, {SIC:\TURBO\COPY.PAS}. Including the program is much cleaner than copying it into my current program and deleting it when done. It's easy to remove the single SInclude line.-Robert Christopher Kobus; Madison, Wisconsin

Clever! Turbo Pascal stops compiling when it reaches a legitimate "END."

statement, even if it's in an SInclude file. Hence you can \$Include a whole program at the top of the program you're working on.-Neil J. Rubenking

Using C filters to put extended characters into WordStar files

Using the IBM box drawing and other extended ASCII characters with WordStar is a nightmare. While WordStar 4.0 moved a step in that direction, most extended AS-CII characters are treated as if they were

you use any extended ASCII character with WordStar, I wrote WS4XLATE,C, a filter that translates a file containing any extended ASCII character into a document that WordStar 4.0 can use directly or import into an existing document.-Dan Laslev: Cordova, Tennessee

The program WS4XLATE is a typical filter (a number of which have been previously discussed in this column). Filters are excellent tools for learning to program in C and can be used as the basis for hundreds of other programs.

As in most filters, all the characters

```
UNI COPY
Buffilee = 16364;
                                                   Will. Buffles) of Sytes
                E BrcFileError(ioCode : Syte);
    ors
Write(#7, 'I/O result of ', icCode, ' (decimal) ', #26);
             (87, 'I/O reet...);
; WriteIn(' Source file not found.');
; WriteIn(' Too many files open.');
...\tala(' 'Reset' unknown I/O error.');
            UNE DatFileError(ioCode : Byte);
    018
Mrite(67, '1/O result of ', Locode, ' (decimal) ', $26);
      its jobode or "..."

185 jobode or "..."

187 : Writate(" Disk data area foll.");

187 : Writate(" Disk directory foll.");

187 : Writate(" Disk directory foll.");

287 : Writate(" Tom Many files open.");

48 Writate(" "Newrita" unboome 1/0 arror.");
          ('Copy from file : ');
n(Filedemea);
(' To file : ');
     dlo(FileSameS);
      Asolgn(BrcFile, FlloGameA)
Asolgn(DatFile, FlloGameA)
      (* Note second parameter in "r
($I-) Reset(SroFile, 1); ($I+)
```

```
their normal ASCII counterparts. To let
                                     Code := IOResult;
lotode ↔ E THIN SccFileError:lotode:
                                       ors
otra: beerite(Detrile, 1): ($1+)
                                           nde := lomesult;
iocnde <> S THEN Detriletrror(iocode)
                                               Arull := Felse;
LE (NOT Der(Secrile)) AND (NOT DisArull) DO
MGCS
                                                (* Note fourth parameter in "blockread". *)
                                                           (ErcFile, Buffer, Bufflise, ReceRead);
                                                        Code := IONesult;
LoCode 🗢 3 THES
                                                          BrcFileError(ioCode);
                                                              krull :- True
                                                                  citarbattile Buffer Bacellands
                                                    NOT DiekPull THEM WriteLn('File copied.')
                                        writelars7, 'File can not be copied onto itself.')
```

Figure 2: An improved version of the COPY PAS program with built-in error checking.

```
PROGRAM Delete;
                                                                                                  ELSE WriteLn('Unknown I/O error.');
  ioCode : Byte;
  FileVar : FILE;
FileName : STRING(255);
                                                                                               Write('Delete file : ');
      ocenuse legrror(lecode : syte);
                                                                                               Assign(FileVar, FileEs
($I-) Erase(FileVar);
                                                                                                                                     {$I+}
     Write(#7, 'I/O result of ', iocode, ' (decimal) ', $26, ' ');
    Write(8); 'I'v result or ;
for (ASK iccode of
f91: WriteLn("Filegal operation for e logical device.");
f28: WriteLn("Too many files open.");
                                                                                               IF ioCode O S THEM ioError(ioCode)
```

Figure 3: A better way to delete any file without leaving the Turbo editor.

Ifanyone tries to tell you that one language fits all, turn the page.

To each





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LANGUAGES

Anti- michigan

```
/* NELLATE: clusteless of tweeless of twee
```

Figure 4: Add support for extended ASCII characters to WordStar 4.0 using this C filter.

pass through the program from input to output. On output, extended ASCII characters are preceded by a 1Bh and followed by a 1Ch. This forces WordStar to treat them as extended characters in the text. A simplified version of the WS4XLATE program is shown in Figure 4.

In the main loop, each character is ANDed with 80k decimal 128, binary 10000000) to isolate the high bit. A binary 10000000) to isolate the high bit. A binary 10000000 to isolate the high bit. A binary 1000000 to isolate the high bit. A binary 10000000 to isolate the high bit. Stended characters fall in the range from 128 to 255, so their high its always on. And the value 600 was since only one of its bits is one—the same high bit. Thus, a bitwise ADD with 80k will be true only for values in the extended ASCII range.

Since the if statement will be true only for the extended ASCII characters, they will be filtered. Each of the extended AS-CII characters will be written to the output preceded by the LEADIN character and followed by the LEADOUT character. Otherwise the character is passed through the filter and written to the output.—Richard Hale Shaw

Productivity Tip

Save yourself an extra long-distance call to Microsoft's switchboard just to get the number for technical support. You can reach Microsoft's technical support directly at (2005 882-8089).

Productivity Tip

The Turbo Pascal built-in Read procedure was changed between Versions 3 and 4. When you use Read to input a string variable, it does not clear the end-of-input marker. Only a ReadLn does that. In general, use ReadLn for string variables.

A Turbo Pascal filter that finds ASCII text in .EXE or .COM files

Here is a simple Turbo Pascal program, itside in Figure 5, which you can use to find any ASCII test in an .EXE or a. COM file 1 use it to see all the messages a program prints to the screen and to look through programs obtained from bulletin boards for any messages that may indicate a "bomb" program (although this is not always a foolproof method).—Michael McGiffer: Minintation, Mest Virginia

The original program simply printed out every printable character in the source file. I enhanced it a bit to let you choose a minmum length for the strings you'll see. The program puts each string of at least the minimum length on a separate line. If you see "Arf! Arf! Gotchal" in the output, think twice before running the program. Note that the program doesn't check for

```
| Comparison | Com
```

Figure 5: An easy way to find ASCII strings in a .COM or .EXE file.

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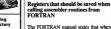








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LANGUAGES

The FORTRAN manual states that when calling a routine written in assembler, registers SI, DI, SS, and DS should be preserved. But my first experiment with this produced strange results. I eliminated the problem by saving all registers. Then I went back to find out what went wrong.

existence of the input file-bad filenames will crash it .- Neil J. Rubenking

My investigation revealed that FOR-TRAN assumes that the direction flag will be in the same position before and after a subroutine call. Changing it-from CLD to STD, for example-inside the assembly routine causes problems. To be safe, I now always save and restore the flags with a PUSHF/POPF combination.-Donald E. Haselwood; Clearwater, Florida

The direction flag determines whether the next piece of data used in a block move or compare has a higher or lower address than the current one. This flag comes into play any time a memory move or string copy is performed, so you can easily see why reversing it can cause problems.

Although not widely documented. some functions of the INT 10h video routines in an early version of the IBM PC ROM BIOS destroy the BP register. Since the BP register is used to control the stack environment, altering it unknowingly will usually result in a program crash. So when you are writing assembly routines to enhance FORTRAN's screen output, be sure that you save and restore the BP register as well -Robert I. Hummel

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PC TUTOR



A comprehensive explanation of the archive bit; a way to prevent program crashes from an undocumented bug in the original IBM PC ROM BIOS.

An explanation of what the archive bit is used for in DOS

I know how to set and remove the archive bit and I know how to display if it is on or off. But I have no idea what it's for! There's no clear explanation in my MS-DOS 3.2 reference manual, so I'm turning to you for held.

What is the archive bit for?—Jeff Salgo; Anaheim, California

The active bit, one of several attributes a DOS disk filt may prosess, is set to by any DOS operation that changes that file. This bit is used to good advantage by back-up programs. These programs usually rest the archive bit to off after they have copied the file. Thus, copying only files set the archive bit to off after they have copied the file. Thus, copying only files that have changed since the last backup means copying all files with the archive bit set to on. But not everyone is as familiar with file attributes as Mr. Salgo, so I'll exolain some of the basics.

The PC-DOS and OS/2 operating systems use a directory structure to keep track of files stored on-disk. The directory structure itself is stored on the disk and contains a single 32-bit entry for each file on the disk. The structure of a directory entry, and the information stored in it, is shown in Figure 1.

Although stored in a compressed format, most of the fields in the directory entry contain the file information that you see when you use the DOS DIR command; filename, time and date of the last change, and file size in bytes. DOS uses the 16-bit

field labeled starting cluster (with the file allocation table, or FAT), to locate the physical position of the file on the surface of the disk. The field labeled reserved is unused in DOS 1.0 through 3.31. However, this field is numored to be used in future

DOS Directory

0	Name
0Bh	Attribute
0Ch	Reserved
16h	Time
18h	Date
1Ah	Starting cluster
1Ch	File size

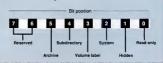
Figure 1: The format of a DOS disk directory entry, and the contents of each field. releases of DOS and OS/2 to hold additional file information. The remaining field is known as the attribute byte.

The attribute byte is not treated as if it contained a single value but is subdivided into eight separate 1-bit fields. Each bit represents a particular characteristic that a file may possess under DOS. The 8 attribute bits and their meanings are shown in Fisure 2 below.

riguez e totow. Whenever DOS is called upon to read, white, delete, rename, or otherwise work with a file, it examines the attribute byte to determine what a steiners are permitted. A system of the determine what a steiners are permitted, a byte has the read only bit set, for example, cannot be overwirten or deleted. Hidden and system files will not be included in the list of files generated by the DIR command. If the subdirectory bit is set, the file contains directory information and is for DOS is internal use only.

As I mentioned, whenever a file is

DOS Attribute Byte



6-bit | Figure 2: Each bit in the attribute byte identifies a single characteristic of the file it describes.



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■ PCTUTOR

modified by DOS, the archive bit in the attribute byte is turned on (set to 1). This bit is never used by the DOS file system in everyday operations but is provided to backup programs as a "courtesy."

Viewing and changing file attributes can be accomplished in a number of ways. Unfortunately, ATTRIB.EXE, which was introduced in PC-DOS 3.0, cannot be used. This laughable program is written in C (it's about 15K long) and allows only the read-only bit to be turned on and off. Subsequent versions reduced the size somewhat but added no more capability

(For trivia buffs, the 3.0 and 3.1 AT-TRIB programs bear the name of one of the chief architects of DOS, Mark Zbikowski. The 3.2 version has the date December 6, 1984, and the initials "PR." Finally, the name "W Russell Whitehead" appears prominently in Version 3.3.)

A better way to examine and toggle file attributes is to use ATTR.COM, a free utility written by Charles Petzold and published in PC Magazine's June 10, 1986, Programming/Utilities column. This 627byte program, written in assembler, lets you set and reset any combination of the read-only, hidden, system, and archive bits. ATTR may be obtained via modern from our information service, PC Mag-Net. Instructions for using this service are given in each issue's Utilities column in the "By Modern" sidebar.

An undocumented bug in the original IBM PC ROM BIOS can cause program crashes

I'm having a serious problem finding anyone who can answer my question. I am developing assembly language routines that will be called from a C program. One of my C programs that uses these functions works great on my IBM-compatible computer. When I tried the same program on true IBM PCs, it worked on two and failed on two others.

I found that the problem occurred during one of my assembly routines that clears the screen. Although my routine successfully cleared the screen and returned control to the C program, the BP register was altered during the INT 10h instruction. The BP register is critical to the calling C

function and causes the program to fail when it attempts to restore the SP register.

None of the information I have indicates any results like this. The obvious solution is to save the BP register. Do I need to do this for every interrupt? Should I save other registers, too? Why don't any other programs I've seen save the BP register for interrupts?-Jonathan Wood: Tustin, California

It's true. IBM goofed when writing the original PC's ROM BIOS. In the prologue to the interrupt 10h handling routine. where a long list of registers is pushed, the BP register is conspicuous by its absence. The Scroll Window functions change the BP register while working. PCs with later versions of the system board BIOS fixed this oversight. (EGA cards also replace this section of the BIOS and remove the problem.)

If the calling program doesn't save and restore the register, the results can be disastrous. High-level languages-C and BASIC, for example-use the BP register as a reference pointer to create a stack frame when entering and leaving subroutines. Changing BP corrupts the stack frame and can cause mysterious program crashes.

To ensure that your programs will run on those PCs with the faulty BIOS code. you should save the value of BP on entry and restore it on exit with the PUSH/POP instruction pair. If you use the BP register inside the routine to access parameters on the stack, you'll need to bracket each video call with code like this:

PUSH 10H INT

Copies of the BIOS with this problem are easy to identify by checking their release date. The DEBUG commands used to create a date-checking program are shown in Figure 3. First, you should make sure that the DEBUG program is in your current directory or in a directory specified in your PATH command. Then, start DE-BUG and enter each of the commands exactly as shown. Press the Enter key once and only once at the end of each line, including the blank line just after the RET instruction. When the process is complete,



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■ PC TUTOR

N BIOSDATE.COM A 199 MOV AX,F000 MOV DS, AX SI,FFF5 MOV cx,8 MOV T.ODSB MOV AH.E INT 10 LOOP 10B INT 20 RCX 14 w 0

Figure 3: The DEBUG script for BIOSDATE.COM. Follow the directions in the text to create the program and run it to display the ROM date for your computer.

N VIDEOFIX.COM A 100 JMP 0111 PUSH RP PUSHF CS: CALL FAR [010D] POP RP 9992 RETF DW ø DW MOV AX, 3519 INT MOV [Ø1ØD],BX MOV [010F].ES MOV AX, 2518 MOV DX.0102 INT MOV AX, [002C] MOV ES, AX AH, 49 MOV INT MOV DX.0012 MOV AX, 3100 INT 21 RCX 37 W o

Figure 4: If you're still using a PC with the original BIOS, the program VIDEOFIX.COM will fix a nasty bus.

BIOSDATE.COM will have been created

in the current directory.
Simply nm BIOSDATE to display the release date of your computer on the screen. The BIOS date that contains the screen. The BIOS date that contains the your computer, you can avoid potential problems with a simple memory-resident program. VIDEOFIX intercepts calls to the interrupt IO wideo routines and unantainally saves the BP register. The DE-BIOC commands used to create the pro-VIDEOFIX using the same procedure given above for the BIOSDATE program.

The best place to install VIDEOFIX is as the first line in your AUTOEXEC. BAT file. Any programs run after that will have to pass through the patch to get to the BIOS. Don't use this program if you have an EGA or VGA card installed. It's not needed and will interfere with some advanced function calls.

Productivity Tip

Each issue of PC Magazine, the Productivity section is crammed full of great tips and techniques on everything ranging from spreadsheets to programming languages. But while these tips are great, they're also

hard to keep track of.

The Editorial Product Index is a little
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name, topic, and page number. This information can be entered into a small database. You could even use your word processor and search for keywords.

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The PC Tutor solves practical problems and explains points of general interest about using your hardware and software more productively, and answers basic questions about DOS and systems in general. To see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016.

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Connectivity **CLINIC**



X.25: a standard for arranging, transmitting, and routing data through switched networks: automate micro-to-mainframe connections with an Application Program Interface,

Automating PC-to-mainframe connections using an API

Here's how I connected PC users to a mainframe database so they have all the power of the PC while the mainframe thinks it is handling only 3270 terminals.

The application is text processing, where all editing and composition is carried out by PC workstations and photocomposition is performed by the mainframe. We also have a mainframe database holding thousands of documents requiring text processing that is done on the PCs.

I wrote a program that takes requests from the workstations and sends them out the LAN gateway computer in a format the mainframe understands. On our Novell LAN, the gateway is a PC that is identical to the text processing PCs, but it also contains a Pathway Designs SNA board and driver software. Pathway provides an API that allows access to screen buffers, status sensing, and sending and receiving by high-level languages such as C and Pascal. This API let me write the application protocols as I needed them while the Pathway drivers handled all the details of SDLC and SNA transmission.

One of my major objectives was to make the application look "native" from each end. That is, the PC operators were not to be concerned with mainframe terminology, such as CICS sign-ons and error codes, and the computer operations staff with the mainframe did not wish to

support a non-3270 application. The application on each PC posts re-

quests for mainframe action to a queue file maintained in a public directory on the LAN file server. My program de-queues each PC request and translates it into a CICS transaction using 3270 Data Stream commands and orders. In addition, the software watches for error conditions and responds like an intelligent user. For instance, if a record is received from the mainframe but is not saved properly on the LAN data files, a CICS transaction is generated back to the mainframe. Finally, our communications program automatically logs on and off CICS and is capable of

managing as many as four sessions. With this system, I saved our investment in mainframe hardware and software but eliminated the need to train PC users on mainframe procedures .- Chet Floyd; Hermosa Beach, California

The 3270 tutorial in the November 29. 1988, issue of PC Magazine (see "Puzzling Out the Mainframe Connection: A Tutorial") describes how terminal-emulation software acts on a PC to make the screen and keyboard work as a 3270-series terminal.

This letter shows the value of the Application Program Interface (API) that many companies provide with their 3270 terminal-emulation software. The API description tells what memory locations and registers a DOS application program can use to interact with the emulation program. Interaction includes reading data from the PC's screen, responding to changes in the status of the communications lines, and sending data to the mainframe.

If you use the API creatively, users don't have to know any of the arcane processes of 3270 communications. You can hide the sign-on activities and all the other levels of mainframe interaction behind familiar DOS menu programs, batch files, or the programs you write. Users can request information or actions in terms familiar to them. And your program, working through the API, can translate their requests into a form the mainframe understands.

Since the API lets you create batch files, menus, and programs that hide the mainframe interaction from the user, you can create a program that emulates an expert mainframe user while not bothering the person plugging away on the PC.

Unfortunately, not all APIs are alike. You usually have to learn the techniques and quirks of the specific API available with your terminal-emulation software. IBM created a good interface it calls the High-Level Language Application Programming Interface (HLLAPI), pronounced ha-lop-pee. This interface was provided in the support software for the now defunct IBM 3270 Personal Computer. Many other companies support the HLLAPI interface in their products. IBM recently announced that it will add the HLLAPI interface to the OS/2 Extended Edition but declined to say when.

You can write programs that interface with HLLAPI in assembler, BASIC, C, Pascal, and other languages, but it is a job for programmers who understand both the 3270 communications process and programming with special function calls.

CONNECTIVITY CLINIC

Productivity Tip

There are three good products that allow NetWare stations to share any printer attached to any PC on the LAN: LANSpool from LAN Systems Inc., (212) 431-8484; ManyLink from NetLine, (801) 373-6000; and Hot Server from Hot Ware, (602) 581-2447.

X.25 services: a data communications standard

When you described how to link LANs across the country in the September 13, 1987, issue's Connectivity Clinic, you told us how to use X.25 services and you provided the names of some companies that supply them. Thank you, but what is X.25 anyway'—David Aiwa; Jackson Hole, Woomile Medic Woomile 1999.

Anything that starts with X. or V. and a number is a standard established by the International Telegraph and Telephone Consultative Committee. (In French, its initials are CCITT.) X.25 is a technical standard that describes how to perform several data communications tasks.

At the lowest level, the X.25 standards describe how data is arranged into packets. This job is typically done by a communications processor, sometimes mounted on a PC expansion card, called a packet-assembler-disassembler, or PAD. At the next level, the standard describes how packets are transmitted over a communications line. Often, X.25 transmission is used over a leased line between two computers and only the first two levels of the standard apply to that link. But X.25 also describes how packets are routed through large switched networks, such as Tymnet and other public carriers, as well as private networks like the Defense Department's Digi-

tal Data Network. Switched X.25 networks provide economy and redundancy for reliability.

The use of X.25 networks has grown faster in Europe than in the U.S., where the presence of previously established private data networks slowed its adoption. However, using X.25 in the U.S. will become more important as LANs are linked using long-distance-leased lines and public and private switched data networks.

Productivity Tip

See which COM ports are installed on a PC by bringing up DEBUG, typing d 40:0, and reading the first line of the hex dump. A COMI port is shown by F8 03 in the first and second data columns. COM2 is F8 02 in the third and fourth columns. Zeros or other data mean no ports are installed or there are hardware conflicts.

MOUNTAIN'S FILES HARD DISK CRASH



New high-performance 3Com server can overrun older EtherLink cards

We recently upgraded from a 3Com 3Server3 to a 3Com 3S401 using an 80386 processor. We like the 3S401, but the high performance of this server creates a problem with our good old EtherLink (3C501) cards. The problem is that 3+Share's default configuration creates SMB (Server Message Block) file I/O messages of 4,096 bytes. (This is defined at the workstation by the /z parameter on the MSRE-DIR line in the AUTOEXEC.BAT file.) But since Ethernet handles frames of about 1.500 bytes, the 386 server is sending multiple Ethernet frames in order to complete one packet. Unfortunately, old 3Com 3C501 network interface cards can be overrun when they have to handle the data from consecutive frames

The solution is counterintuitive. By reducing the MSREDIR buffer size to something under 1,500 bytes, the 3+Share software will send more SMB packets, but the cards will handle fewer multiframe Ethernet packets.

We see point-to-point performance of around 1.4 megabits per second from an AST Premium 286 with 3C503 network cards connected to the 3S401. This is almost 21/2 times the performance of the 3Server3. Also, the performance of ATclass workstations is noticeably better when using the 3C503 and 3S401 compared with the 3Server3 and any other workstation.-Doug Ruby: Waltham. Massachusetts

This is a helpful hint on packet sizes. When I look at the Ethernet traffic with an analyzer, I don't see evidence of our 3C50I cards stumbling over data, but I keep hearing that it happens. Anyone us-

ing this fix should keep in mind that it will have a detrimental impact on the performance of the server and the workstations using the newer Ethernet II (3C503), 3C505, or Micro Channel cards

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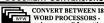
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HIGH-SPEED 286 MACHINES Just how fast can a 286 go? Some predicted that when the 80386 microprocessor was introduced, the 80286 would be put out to pasture. Instead, computer manufacturers are finding ways to squeeze 20-MHz performance out of the 286-based machines. Edward Mendelson reviews six speedy 286s from Dataworld, Dell, Micro I, Northgate, Vector, and Zeos.

APPLESHARE Frank J. Derfler, Jr., looks at new workgroup products from Apple that help improve the PC-to-Macintosh connection.

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PC MAGAZINE • DECEMBER 13, 1988

AFTER HOURS



Adding the Personal Touch to Your Holiday Greetings

BY M. STEPHANIE RICKS
Good things come in small
packages, and Broderbound's
Holiday Edition clip art is no exception. This supplementary
program lets you add seasonal
touches to greeting cards, letterheads, banners, and signs you
create with The Print Shop, also
from Englerhund

from Broderbund.

The Print Shop graphics package is easy to use. The main menu lists the format choices (card, banner, and so forth); all you have to do is choose one using the cursor keyor a joyistic. Then size and position graphic items, select leitering (Dec., Block, Type-writer, and Stencil font styles are just some that are included), and type in a festive message. It's that simple.

It's that simple.

Once you have copied the Holiday Edition files into The Print Shop directory, you can choose from among more than 100 graphic items. Holiday Edition boosts The Print Shop's collection of graphics with choices like Hanukkah menorahs, Christmas holly and wreaths, and a plump baby New

Year. There are also icons for the Chinese New Year, Martin Luther King Day, Mexico's Independence Day, Mardi Gras, and Arbor Day.

and Artor Day,

If that's not enough for you,
you can create your own images
or modify existing ones in The
Print Shop's Graphic Editor.
Here, on-screen instructions
clearly outline how to alter
icons and font elements. Note
that original and altered graphic
items must be saved to disk before they can be used.

While half the fun of this is to design everything yourself, The Print Shop is equipped with predesigned templates that you can personalize if you're pressed for time or suffering

from "creativity brain drain."
There is one glitch in The
PrintShop that could make your
hollday designing festivities
somewhat less than jolly. If you
switch to another front (for example, a wider one) after typing
in your message, you may lose
parts of the text. This means
you'll have to rekeystroke missing punctuation marks and word
endings, a tedious and tiresome

process.
With colored printer paper
and printer ribbons, you can further enhance your designs. (The
Print Shop thoughtfully includes a stack of red printer paper and envelopes.) The output
is determined mostly by your
printer's capabilities and your
ingenuity. My test printouts

were rather handsome, with crisp lettering and attractive graphics.

graphics.
The days of construction paper, water-soluble paste, stencils, and round-tipped scissors are long gone. The Print Shop, Holiday Edition, and a little imagination all combine to give Hallmark some pretty stiff competition—you.

List Price: Holiday Edition, \$34.95; The Print Shop, \$59.95. Requires: 128K RAM, EGA card, DOS 2.0 or later. Copy protected. Broderband Software, 17 Paul Dr., San Rafael, CA 94903-2101; (415)

CIRCLE 686 ON READER SERVICE CARD



402.3200

NewsQuest: A Fun Way to Develop Your Child's Nose for News

BY STEPHANIE IZAREK

Are you constantly locturing your children on the importance of being aware of world events, only to be ignored because they are too busy playing Tents on your computer? Then this hold-day season, you should consider giving them a subscription to Time Inc.'s NewsQuest quit game. It's the computer equivalent of those cereals that taste factories with the computer of the computer of those cereals that taste factories with the computer of the computer of those cereals that taste factories will be computer of the computer of

Each week a NewsQuest quiz disk, based on that Monday's issue of Time magzine, will arrive at your doorstep. The object of NewsQuest is to Earn the prestigious title of ''News-Hound'' by identifying the speaker of a quote that's concaled in a box at the bottom of the screen.

To capture the title, you must answer questions, grouped in categories that correspond to the editorial departments of Time magazine, such as World.

Nation, or Entertainment. All questions start out as fill-in-theblanks; each time you answer a question correctly (spelling counts) several letters of the hidden quote are revealed. If you answer incorrectly some letters already earned will dis-

appear.
You are then faced with a choice: Will you risk some more letters for a hint, or should you change the format of the question to multiple choice? Be aware, though, that answering fill-in-the-blank questions correctly is worth more letters than multiple choice.

You cannot attempt to idenYou cannot attempt to idenYou cannot attempt to idenyou cannot attempt to idenyou cannot to the proper to identify the source and fait, all
the revealed letters will disappear and the game will end. The
strategy is to keep answering
questions until you are absolute. So
y sure of the speaker's identify.
There are no bonuses for answering correctly with fewer
letters and no penalty for taking
your time.

If you do so well as to be ordained a "NewsHound," you get the chance to wallow in even greater glory by racking up honor points for answering additional historical questions.

NewsQuest is also available for educational institutions. Schools can compete for up to \$10,000 in scholarships. NewsQuest is not only an in-

NewsQuest is not only an informative and educational game, it is highly addictive. The only problem is the steep price—589 plus postage and handling for a 30-week subscription that does not include a subscription to Time magazine. Unless you already subscribe to Time, plan on spending some additional money.

List Price: NewsQuest, \$89 for a 30-week subscription. Requires: 256K RAM, DOS 2.0 or later. Not copy protected. Time Inc., Time & Life Building, Rockefeller Center, New York, NY 10020; (212) 522-

CIRCLE 686 ON READER SERVICE CARD







Coloring by Computer: An '80s Approach to an Old-fashioned Pastime

BY ALAN COHEN

BYALAN COHEN
Along with Salvation Army
Santas and Perry Como specities, each holiday season
brings with it a flood of new
high-tech toys, all designed to
win the bearts of children everywhere. While ColorMe: The
Computer Coloring Rit (339-95
from Mindscape) may not be a
GI Joe Doll that can do math, it
adds a state-of-the-art twist to
an old-fashinoed pastime.

ColorMe allows the young artist, using a mouse, joystick, KoalaPad, or keyboard, to easily draw his own 16-color masterpieces.

ColorMe's drawing features are strictly no-frills. This is intentional, however; the program was designed to be easy to use, so children can spend more time drawing and less time figuring out sophisticated options.

By moving the curson—which appears as a "crayon"—across the screen, lines can be drawn in any of four different thicknesses or styles. For example, the "scribble" crayon makes a fuzzy—as opposed to solid—mark. Text (choose from among four point sizes) can be easily mixed with the graphics, and a Fill feature colors in outlined shapes in one quick step. Mistakes can be undone instantly with an Oops option that erases the last paint stroke or color choice.

Using the Cut & Paste feature, predrawn pictures can be from picture disks (two are included with the program-one features characters from Rainbow Brite, the other stars the ColorMe Kids) and "pasted" onto a scene. Each of these stored pictures comes in two forms: colored-in and outlined. The outlined form allows the child to color in the picture to his or her own liking. A Big Dots feature, which zooms in on a selected portion of the screen, makes coloring even the small-

est areas a snap.

And for those few rebellious children who prefer to do every last thing the old-fashioned way, Mindscape has included colored printer paper (a printout feature makes a hard copy of any picture) and, yes, even a hox of cravous.

List Price: ColorMe: The Computer Coloring Kit, \$39,95. Requires: 256K RAM, CGA or EGA adapter, DOS 2-1 or later. Copy protected. Mindscape Inc., 3444 Dundee Rd., Northbrook, IL 60062: 68007 221-9884 ourside II:

(312) 480-7667. CIRCLE 687 ON READER SERVICE CARD



Monday Night Football You Can Play Anytime

BY GREG PASTRICK

What do you want this coming holiday season? If you're a fool for football, you're probably hoping your favorite team makes it into the play-offs and has a shot at the big one in January. But if it's looking like another disappointing season for the home team, you can reinvent some of this fall's gridion gore or glory with John Elway's Quarterbank:

Quarterback (\$29.99 from Melbourne House) puts you in command of the NFL team of your choice. You enter the league at a base starting salary. You advance your wages and player standing by matching strategy and moves against a

programmed or live opponent. You can select to play Quarterback at one of nine speeds, but the game is best when played at the faster speeds. There can be only one free-moving player, controlled by the user, on offense and defense. The movements of the other players are programmed. Passing and kicking are ac-

complished by "point and re-

lease"; using a joyatick or the keyboard, you point the cursor to the distance and direction you want the ball to travel and then release the fire button or key. Running, blocking, and tackling are simple matters of maneuvering the active player via the directional keypad or joystick. Active players can jump in all directions—useful for blocking kicks and passes, and gaining extra vardage.

gaming extra yaruage.

On offense, the passer/ball
carrier has initial control at the
line of scrimmage. There are 12
plays to choose from: based on
play selection, the player has
the option to pass, run, or improvise on a broken play.

On defense, the active player sets up as a linebacker against the offense, according to the play selected. The active player is also free to roam the field in search of sacks, interceptions, and open field tackles.

and open Heid tackles.

Quarterback is best played
with two live opponents using
joysticks. So many games are
isolated affairs; it's refreshing
to have a PC game that's active,
involves strategy, and allows
others to share the fun.

List Price: John Elway's Quarterback, \$29.99. Requires: 256K RAM, DOS 2.0 or later, joystick optional. Copy protected. Melbourne House, 711 W. 17th St., Unit G9, Costa Mesa, CA 92627: (714) 631-1001.

CIRCLE 686 ON READER SERVICE CARO



AFTER HOURS



Genealogy

find it inconvenient to have to store the program and data files in separate subdirectories

in separate subdirectories.

Genealogy DB has a good variety of output, including family group charts, a pedigree chart, two descendants charts, as well as numerous sorted lists. The 14-generation descendants chart—which can present up to 1,000 individuals on one long printout—is impressive, but how many families can trace

their roots back to Pocahontas?
Genealogy DB also includes
an option to print reports directly to an ASCII file. The file may
then be edited and manipulated
by a word processing program—just the ticket for including descendants charts in a famity history.

List Price: Genealogy DB, \$95. Requires: 512K RAM, DOS 2.0 or later. Not copy protected. Geneware Inc., P.O. Box 872, Westminster, CA 92684; (714) 897-0499.

CIRCLE 691 ON READER SERVICE CAR

Lineage Master

Lineage Master is a commanddriven program that makes inputting your family data a very speedy process—once you get the hang of it.

Generally, one or two characters of a command are all that

are needed for Lineage Master to perform a function. Pressing E, for example, brings up a fullscreen edit, F finds a record, and A adds an individual.

Linking is automatic: while the computer assigns an ID number to each individual, you navigate by name and relationship. Once an individual is entered, the spouse may be added simply by typing AW (for add wife) or AH (for add husband). Similarly, children are added to a family with the AC command, parents with AP.

Some of the default events, like STP (Seal to Parents) and End (Endowment), are somewhat cryptic for those unfamiliar with the terms used in Mormon genealogy. Lineage Master does allow you to define event titles tailored to you own

family circumstances.

Lineage Master is not tolerant of date formats. The year
must be written numerically and
the month field must consist of
its first three alphabetical characters. The program can handle

dates like "about 1820" or "after 1820", but it cannot deal with a range of years, as in "1820-1822".

Rather than having just one textual note for each person, they can be linked to specific events, such as a birth or death. This is ideal for citations and will even be appreciated by the professional genealogist. When it comes to reports, Lineage Master produces both family group charts and a handsome pedigree chart, along with numerous alphabetical lists. However, some important reports, such as an Ahnentafel chart (a form of compressed pedigree), are missing.

Unfortunately, Lineage Master also cannot put multiple databases in the same subdirectory. Another inconvenience: the manual is supplied on a disk file that you must print yourself. Lineage Master is written in

dBASE III, and it executes more slowly on a 4-77-MHz PC than not would like. But on an AT-class computer screen, updates are almost instantaneous. Even on a slow PC, Lineage Master is production-oriented. There are short and powerful commands that can do things that other programs require dozens of key-grams require dozens of key-

strokes to accomplish. The ZL (Zap Link) command, for example, can move a child from one family to another in just two keystrokes.

Of these two programs, Lineage Master has the better user interface because it employs names and relationships, rather than numbers, in its data entry and linking routines. Genealogy DB is the speedier of the two, and it boasts a nice variety of output. It could even be rated as

a "buy," but beware of its reliance on you to remember ID numbers. List Price: Lineage Master, \$79.

List Price: Lineage Master, 579. Requires: 256k RAM (hard disk and 8-MHz or faster computer recommended), DOS 2.0 or later. Not copy protected. GeneaLogic Systems; 140 W. 900 South, Orem, UT 84058; (800) 336-6644.

CIRCLE 690 ON READER SERVICE CARD

Roots III . The Next Generation

In the July 1988 issue, we took a hard look at Roots II and were impressed. Now there's a new addition to the Commsoft family: Roots III is the hale and hardy offspring that incorporates many of the features that we, and you, wanted to see in Roots II.

For instance, there's now an easy way to enter children into a file. Once you enter the events pertaining to the parents, a keystroke brings up their marriage record; from that screen you can add the children. As a time-saver, cortain items such as a child? birthplace will default to an existing value, such as the birthplace

of its sithling; this may be easily changed.

Roots III will handle more than 65,000 individual and 65,000

marriage records. There's even a way to keep multiple databases
in the same subdirectory, although you'll have to exit and restart
the growarm to switch from one to another.

There are more reports—at least a dozen—including a 6-generation pedigree and a 90-generation descendants chart (that should take you back to about 300 B.C.). And you can get to them faster. In fact, you can get to everything faster with the new expert mode. An Alt-key combination usually takes you right where you want to go.

One of the features most requested by professionals was the ability to annotate each event. In Roots III you can attach notes and estations to any field.

There's also a new optional utility program called Revent, which has a calendar of 3,000 historical occurrences so you can link your own family's history with major events.

Roots III has gone up in price to \$250 (you can get a copy by calling Commsoft at (415) 967-1980), and it is not as easy to learn as Lineage Master. But then again, it has few limitations. If Ben-Hur is one of your ancestors, Roots III can find a place for him.—Donald B. Trivette.

Introducing the Newest Software Games — For Your PC

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famous 18 holes of championship golf - with

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most dangerous short hole in golf" - the 12th

personally selected by Jack Nicklaus from such

Andrews, and more ... Or play oo 2 additional

who possesses skills patterned directly after his

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expert levels allow player to select individual

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distance to the pin, hazards, pin placement and

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eagles. It even records the seven best rounds

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courses designed by Jack himself.





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"Lucky" in Leisure Suit Larry's original PC game, you're in for a real surprise with his new worldwide adventure. For those who have not met Larry - hang oo!

We meet Larry in L.A., dumped by his latest fling. Of course, Larry is nobody's fool. He takes his last \$1 bill and plays the state lottery. Luck is with Larry - he wins and is invited to participate in the "Big Spin". Larry wins millions and is immediately a very

popular "Dude" But wait! Behind all this fun and frivolity lies a ballyhoo of espionage and intrigue. With KGB agents, Hairy Krishnas, and dozens of "available" women on his tail, Larry's good

fortune could vanish quicker than his hairline!! Dance, party, and chase the Babes that's Larry's motto!! But with all the swine ing times you'll have, Leisure Suit Larry II is also a very challenging adventure game that will test your street smarts to the fullest. Larry is not exactly the most polished Playboy around. After all, who else but Larry would wear tennis shoes with his polyester suit, cut his hair so short that you see his "whitewalls", or tell the girls that his new colored contacts

With outrageous 3-D graphics, the incredible life-like animated characters bring the world of Leisure Suit Larry II to life in a way you never thought possible. They walk, talk, dance, flirt - even ignore some of your best pick-up lines ("What's your sign, babe?

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AFTER HOURS



Family Ties: Help in Tracing Your Links with the Past

BY DONALD B. TRIVETTE Where scribbled notes and scraps of paper in a dresser drawer served as the family record-keeping system of our grandparents, today's generation can use genealogy software to help them keep tabs on kin. A genealogy program is really a special database that lets you link (or "hook") children to parents, brothers to sisters, husbands to wives, and cousins to cousins. It ties family members together so tightly that no one gets lost in the socks drawer.

gets tost in the sock artwer.

Of course, building a database of the (family) ties that bind can be a complex and time-consuming procedure. You'll want a program that makes it easy to enter and edit data as well as to link individuals into families. And lastly, a program

must generate complete and descriptive output reports. Some of the more-sophisti-

cated (and more-expensive) packages, such as Family Reunion (reviewed in After Hours, July 1988) and Roots III (see sidebar), offer a plethora of features that will warm the hearts of the seasoned and/or professional genealogist. But the amateur genealogist might find that his needs are adequately met by the two low-end programs reviewed here. Genealogy DB and Lineage Master. Though they are not as feature-filled as their high-end competitors, the beginning genealogist may find their smaller price tags (about \$100 to \$150 less) appealing.

Genealogy DB. S95 from

Geneware, is a speedy little menu-driven program that offers a fair range of features and high-quality output. But be prepared to deal with a somewhat unfriendly user interface to get the results you want.

Birth and death events (or felds), as well as county, eity, and state events are provided for each individual entrant. Then's even a burial place field. To add new individuals to the file or to update old files, you need simply to move to the Persons and Notes sections of the program and fill in the genealogical data at the prompts.

Editine is a full-screen oper-

ation, so you can use the cursor keys to locate and change data anywhere on the screen. Dates are text fields that aren't limited to a specific type of data—for



Genealogy DB supports full-screen editing, so you can locuse and change data in any fields on-screen.

instance, you can enter a birth date as Jan. 1, or even as Too Soon (a sly way of noting that the individual was born only 6 months after the wedding perhans?).

Genealogy DB depends heavily on ID numbers, which it assigns in sequential order, to move from one individual's record to another's. It requires you to use these numbers to link a family together—for instance, there's no automatic add-achild routine. Each time you add achild to almuly, you must one the father's and the mother's ID numbers on the child's record, however, the ID numbers are not checked to see if

they are actually in the file.
Luckity, there is some help
if you can't remember an ID
number—just type a minus sign
and the program enters its
search-by-name mode. This lets
you scroll through the file,
name by name. The documentation suggests that you keep a
printed list on hand to help iden-

printed list on hand to help identify individuals—not a bed idea. Genealogy DB is written in the dBASE inapuage and its file formats are in the dBASE standard. And the program is fast—the indexes are constantly updated so access to any record is quick. However, a professional genealogist, working on several families at once, will

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AFTER HOURS

Tis the season to be jolly and PC Magazine joins in the festivities with holiday gift-giving ideas: The Print Shop and Holiday Graphics Edition Holiday greeting cards, signs, and banners NewsQuest Making current events fun Color Me: The Computer Coloring Kit

An end to the Crayola?

John Elway's Quarterback

Armchair warm-up for

Superbowl Sunday

THE INSIDE STORY. INSIDE.





THE INSIDE STORY. INSIDE.



